HELMINTHOLOGICAL ABSTRACTS

VOL. 27

incorporating

BIBLIOGRAPHY OF HELMINTHOLOGY

For the Year 1958

COMMONWEALTH BUREAU OF HELMINTHOLOGY

The White House, 103 St. Peter's Street
St. Albans, England

Vol. 27, Part 1 Nos. 1–74

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COMPILED FROM WORLD LITERATURE OF 1958

Prepared by the

COMMONWEALTH BUREAU OF HELMINTHOLOGY
THE WHITE HOUSE, 103 ST. PETER'S STREET, ST. ALBANS, HERTS

Published by the

COMMONWEALTH AGRICULTURAL BUREAUX, FARNHAM ROYAL, BUCKS, ENGLAND

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Abstracts in the present number are by:

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Mary W. McKenzie	Sheila M. Willmott
June Mahon	R. D. Winslow
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RETIREMENT OF PROFESSOR R. T. LEIPER

Professor R. T. Leiper retired as Director of the Commonwealth Bureau of Helminthology in June, 1958, after being Director of the Bureau from 1946. He was, however, a guiding spirit in the Bureau since its foundation in 1929 for he was Consultant Director from its inception until he became Director of the Bureau on his retirement from the Professorship of Helminthology in the University of London.

Professor R. T. Leiper was succeeded as Director of the Commonwealth Bureau of Helminthology by Professor J. M. Watson, D.Sc. (Lond.), A.R.C.S.

(*Signed*) J. G. MALLOCH

Chairman
Executive Council
Commonwealth Agricultural Bureaux

HELMINTHOLOGICAL ABSTRACTS

INCORPORATING BIBLIOGRAPHY OF HELMINTHOLOGY

FOR THE YEAR 1958

Vol. 27, Part 1

1—Acta Parasitologica Polonica.

a. KISIELEWSKA, K., 1958.—"Wpływ niektórych czynników na przeżywanie i inwazyjność jaj tasiemca *Drepanidotaenia lanceolata* (Bloch) oraz na dalszy rozwój powstałych z nich larw." **5** (22/29), 585–598. [English summary pp. 597–598.]

b. RYBICKA, K., 1958.—"O rozwoju larw tasiemca *Diorchis ransomi* Schultz, 1940 (Hymenolepididae) w żywicielu pośrednim." **5** (22/29), 613–644. [English summary pp. 642–644.]

c. KAZUBSKI, S., 1958.—"Przyczynek do biologii motyliczki *Dicrocoelium dendriticum* (Rudolphi, 1819) Looss, 1899 w Dagestanie (Kaukaz, ZSRR)." **5** (22/29), 645–648. [English summary p. 648.]

(1a) The influence of various factors on the survival and infectivity of *Drepanidotaenia lanceolata* eggs and on the subsequent development of oncospheres in *Cyclops strenuus strenuus* was experimentally studied. The most infective cultures were those in which the eggs had stayed not longer than six to seven days in water and were at room temperature and in sufficient oxygen. The activity of eggs staying more than eight days in water and lacking oxygen was lowered and the subsequent development retarded or arrested, but eggs could retain their viability for up to three weeks in water. Within the temperature limits for survival of 1°C. to 34°C., the higher temperatures shortened the period of activity of the eggs and speeded up development in the cyclops. Light had no influence on the development of the eggs but desiccation was lethal. G.I.P.

(1b) The larval development of *Diorchis ransomi* in *Cypridopsis vidua* was found to be of the type described for hymenolepidids in copepods. The formation of the rostellum and hooks was similar to that in larvae of the cysticercus and echinococcus types. Ten spines from the primary crown of cuticular spines developed into the adult hooks, the remaining ones atrophied. In experimental conditions, 83% of *C. vidua* became infected with one to 18 larvae and the incidence and degree of infection did not directly depend on the length of exposure. The difference in the speeds of development of single larvae in the same population did not depend on the size of the population. The size of cercocysts decreased with increasing size of populations, but was independent of the rate of development. G.I.P.

(1c) Of the molluscs examined for *Dicrocoelium dendriticum* in Dagestan in Russia, 66 out of 1,707 *Helicella derbentina*, 2 out of 88 *H. crenimargo* and 5 out of 205 *Trichia pheolema* were found infected. The last is a new host for *D. dendriticum.* G.I.P.

2—Acta Physiologica Sinica.

a. TSEN, Y. L. & TING, K. S., 1958.—[Studies on antibilharzial drugs. XII. Prophylaxis and treatment of schistosomiasis japonica with rosaniline *per os*.] **22** (1), 60–66. [In Chinese: English summary p. 66.]

b. TSEN, Y. L. & TING, K. S., 1958.—[Studies on antibilharzial drugs. XIII. Screening of 21 drugs given internally for prophylaxis from schistosomiasis japonica in mice.] **22** (1), 67–70. [In Chinese: English summary p. 70.]

(2a) The number of *Schistosoma japonicum* which develops in white mice is greatly reduced when rosaniline is added to the diet in a concentration of 0·33% one day before infection and continued for 26 days. There was also a great reduction in the number of worms in rabbits

when an aqueous solution of the hydrochloric acid salt at the rate of 0·29 gm. per kg. body-weight was given daily by stomach tube during the 14 days following infection or at 0·1 gm. per kg. daily for 25 days. The drug had a certain degree of inhibitory action on the various stages of development but appeared to be more effective on the sexually mature worms. After mice had been treated for three to four weeks with 0·33% rosaniline diet, or rabbits with 0·6% rosaniline diet, the hepatic shift increased and the number of worms was significantly less and pairing had ceased. The bodies had dwindled and the reproductive organs had atrophied, but gradually recovered in one or two weeks after the drug was discontinued. R.T.L.

(2b) Judged from the number and state of development of *Schistosoma japonicum* recovered at autopsy from mice which had been dosed with one or other of 21 drugs before infection, only five gave any significant protection, viz., Sb-1, Sb-11, Sb-19, Sb-7 and Sb-8. The chemical formula of each of these is given. Sb-1 and Sb-11 chiefly affected the worms during their sexual maturity. R.T.L.

3—Agricultural Gazette of New South Wales.

a. ANON., 1958.—" Foliage and stem nematodes." **69** (3), 157–159.

4—Agriculture. London.

a. SPEDDING, C. R. W., 1958.—" *Nematodirus* infestation in sheep." **64** (10), 480–483.
b. WINSLOW, R. D., 1958.—" Eelworm control. Some aspects of past and present research." **65** (2), 66–69.

(4a) A summary of the results of an investigation on the effect of pasture or grazing management in controlling *Nematodirus* infection in lambs is given. Little trouble is likely where it is possible to avoid using pastures which carried lambs in the preceding year. Those pastures which carried lambs one to four months old will, in the following year, carry the heaviest infection. Spedding suggests that if lambs have to graze on infested pasture they are allowed the maximum quantity of herbage consistent with satisfactory quality, and that the pasture is afterwards completely defoliated by resistant stock. The benefits from control measures such as these should be cumulative. D.M.

(4b) Winslow regards soil fumigation and steam sterilization as too costly for general use in Britain and discusses other possible methods of controlling plant nematodes. Trap-cropping and the exploitation of predators and parasites have so far given disappointing results. Methods of the future may include the use of radio-active materials, but for the present the farmer must rely mainly on crop rotation while plant breeders and nematologists continue the search for resistant varieties. R.D.W.

5—American Journal of Tropical Medicine and Hygiene.

a. WEINSTEIN, P. P., 1958.—" Some projected uses for the axenic cultivation of helminths." **7** (1), 1–3.
b. MAO, C. P., 1958.—" Research on schistosomiasis japonica in China." **7** (1), 58–62.

(5a) In this address Weinstein reviews some of the perplexing problems of helminthology which might be investigated by the use of bacteria-free culture procedures, viz., sensitization and allergic reactions, damage by toxic substances, metabolic injuries resulting from competition with the host for important metabolites and the relation of helminth by-products to the development of neoplasms. R.T.L.

(5b) The essentials of over 200 papers which were presented at the second session of the Chinese National Research Council on Schistosomiasis held in December 1956 are summarized by Mao. From a systematic survey of the distribution of *Oncomelania* and the incidence of schistosomiasis japonica amongst the population, made by faecal examinations and by 58,000,000 intradermal tests, it is estimated that the endemic area is four times the size of France. To the known reservoirs of infection several wild animals including *Felis bengalensis*

5—American Journal of Tropical Medicine and Hygiene (cont.)

c. BIAGI F., F. & TAY, J., 1958.—" A precipitation reaction for the diagnosis of cysticercosis." **7** (1), 63–65.
d. TELFER, J. G., DAVIS, M. R. & BRANCATO, F. P., 1958.—" Effects of phthalofyne in the treatment of human *Trichuris trichura* infection." **7** (1), 66–69.
e. SCOTT, J. A., MACDONALD, E. M. & OLSON, L. J., 1958.—" Attempts to produce immunity against the filarial worms of cotton rats by transfer of developing worms." **7** (1), 70–73.
f. FRAGA DE AZEVEDO, J., CARVÃO GOMES, F. A., BRAGANÇA GIL, F. M., BAPTISTA, A. M. & MAGALHÃES, E. M. DE, 1958.—" Application of radioisotopes to the study of the metabolism of fresh-water snails (Gastropoda-Pulmonata)." **7** (1), 84–89.
g. TAKOS, M. J. & THOMAS, L. J., 1958.—" The pathology and pathogenesis of fatal infections due to an acanthocephalid parasite of marmoset monkeys." **7** (1), 90–94.

chinesis, *Mustela sibirica davidina* and *Meles meles* have been added. In cattle in a village in Szechwan Province the incidence was 91%. Liver puncture proved valuable in the diagnosis of the infection in sheep. *Oncomelania* were found in coastal regions high in alkalinity and salinity. Calcium arsenate and the cheaper calcium arsenite were found to have molluscicidal properties when 500 ml. of a 1% suspension were sprayed per sq.m. Certain species of crabs are predators. One crab consumed over 100 snails at a time. The relapse rate three to six months after a three-day course of tartar emetic was 29·1% in 1,220 patients and 22·1% in 426 patients on a seven-day course. Fine cloth impregnated with 10% benzyl benzoate or with *Camellia oleosa* powder between two layers of the fabric afforded protection against schistosome cercariae for nine hours. R.T.L.

(5c) Thirty-nine instances of cysticerciasis were detected in the 1,339 autopsies made during a period of four years at the National School of Medicine in Mexico City. Antigen prepared from whole *Cysticercus cellulosae* carefully separated from the pig flesh and fat and totally desiccated after treatment with acetone, gave positive precipitin reaction in all cases of cysticerciasis cellulosae, and antigen from *Cysticercus racemosus* gave a positive reaction in cases of cysticerciasis racemosus, the antigens being specific for each type of cysticerciasis. R.T.L.

(5d) Phthalofyne at the rate of 100 mg. to 125 mg. per kg. body-weight by mouth or in combination with the same dose by enema was administered to seven Philippinos with *Trichuris trichiura* infection. They failed to receive any therapeutic benefit and four had nausea or vomiting or both. One patient who received enemata of 200 mg. per kg. and 450 mg. per kg., one week apart, had no side effects or significant benefit. R.T.L.

(5e) The surgical transfer of fourth-stage larvae or immature adults of *Litomosoides carinii* into the abdominal cavity of cotton-rats caused a retardation in growth and in development of infective larvae subsequently introduced through the skin, but only if the number of these larvae was considerably greater than that of the worms originally inserted. When infective larvae were introduced subcutaneously, in the first instance, a greater effect was produced. It is concluded that if antigens were involved those of the more advanced stages differ qualitatively or quantitatively from those of infective larvae. R.T.L.

(5f) Autoradiographs of the tissues of *Helisoma duryi normale* which had been put into solutions containing P^{32}, I^{131} and Cu^{64} indicated that the radio-active compounds were absorbed by the intestinal canal and diffused through the various organs and confirmed the toxic action of copper on the protoplasm. R.T.L.

(5g) Four out of ten *Saimiri o. orstedii* died from peritonitis following perforation of the gut by *Prosthenorchis elegans*. Perforation only occurred when the tunnels made mechanically in the mucosa by the worms became secondarily infected. The tissue reactions produced are illustrated by four photomicrographs of sections. R.T.L.

5—American Journal of Tropical Medicine and Hygiene (cont.)

h. BEAVER, P. C. & DANARAJ, T. J., 1958.—" Pulmonary ascariasis resembling eosinophilic lung. Autopsy report with description of larvae in the bronchioles." **7** (1), 100–111.
i. HSÜ, H. F. & HSÜ, S. Y. LI, 1958.—" On the size and shape of the eggs of the geographic strains of *Schistosoma japonicum*." **7** (1), 125–134.
j. WYKOFF, D. E., FRICK, L. P. & RITCHIE, L. S., 1958.—" Statistical evaluation of the formalin-ether (406th MGL) fecal sedimentation concentration procedure." **7** (2), 150–157.
k. MARCH, H. N. & LAIGRET, J., 1958.—" The effect of cortisone and prednisone on bullous reactions following treatment of filariasis with diethylcarbamazine." **7** (2), 185–186. [French summary p. 186.]
l. PRICE, D. L., 1958.—" The epidemiological field kit." **7** (2), 205–206.
m. BUMBALO, T. S., PLUMMER, L. J. & WARNER, J. R., 1958.—" The treatment of enterobiasis in children. A comparative study of piperazine (Antepar) and pyrvinium chloride (Vanquin)." **7** (2), 212–214.
†n. HSÜ, H. F. & HSÜ, S. Y. LI, 1958.—"On the prepatent periods of the geographical strains of *Schistosoma japonicum*." **7** (2), 239.

(5h) At autopsy on a male Indian with typical status asthmaticus and an eosinophilia of 37%, five nematode larvae 1·8 mm. to 2 mm. long and identified as *Ascaris* sp., probably *A. lumbricoides*, were found, each in a bronchiole entirely filled with mucopurulent exudate. There was massive infiltration of the lungs with eosinophils and scattered eosinophilic granulomatous lesions in the liver. R.T.L.

(5i) Each of the four geographical strains of *Schistosoma japonicum* can be distinguished by the size and shape of the mature eggs. As the eggs obtained from different hosts also show variations any comparison of the eggs of these strains should be based on material obtained from the same host. R.T.L.

(5j) From an analysis of data obtained from the faeces of about 1,000 rural Japanese residents, by the use of Ritchie's formalin-ether sedimentation concentration method in two five-stool examination series, the mean estimates of efficiency for the detection of helminth eggs were *Ascaris lumbricoides* 91·9%, *Trichuris trichiura* 92·2%, hookworm 78·9%, *Trichostrongylus* sp. 41·1% and *Schistosoma japonicum* 47·6%. R.T.L.

(5k) Eight out of a group of individuals, on the Island of Bora Bora, who had received diethylcarbamazine for the treatment of bancroftian filariasis, developed bullous reactions. These lesions collapsed and dried up within 48 hours of treatment with corticosteroids, in six cases as cortisone and prednisone in combination and in two cases as prednisone alone. R.T.L.

(5m) Pyrvinium chloride (Vanquin), a cyanine dye introduced as a new and effective cure for *Enterobius vermicularis* by Royer [under the name of Poquil, for abstract see Helm. Abs., **25**, No. 205a] is now compared with piperazine. Thirty-five infected children were treated with 1·5 mg. per kg. body-weight given as two divided doses, daily for six days and 100% were cured while of 36 children treated at the rate of 2·1 mg. per kg., in two divided doses, daily for six days 97·1% were cured. As such a prolonged course of treatment may not be practical, piperazine with its shorter effective course is considered to be preferable for clinical practice. R.T.L.

(5n) Using albino mice as experimental animals, Hsü & Hsü found no significant differences in the prepatent periods of the Chinese and Formosan strains of *Schistosoma japonicum*, or between those of the Japanese and Philippine strains, but in the Chinese and Formosan strains the prepatent periods were significantly longer than in the Japanese and Philippine strains. R.T.L.

†Abstract of paper presented at the 6th Annual Meeting of the American Society of Tropical Medicine & Hygiene, Philadelphia, October 30 to November 2, 1957.

5—American Journal of Tropical Medicine and Hygiene (cont.)

†o. DEWITT, W. B., 1958.—" Schistosomiasis mansoni in mice with nutritional fatty liver disease." **7** (2), 239–240.

†p. KAGAN, I. G. & MERANZE, D. R., 1958.—" The histopathology of experimental infections in mice with *Schistosomatium douthitti*." **7** (2), 240.

†q. WARREN, K. S. & DEWITT, W. B., 1958.—" The development of esophageal varices in mice infected with *Schistosoma mansoni*." **7** (2), 240.

†r. CHAFFEE, E. F. & RODRIGUEZ, H. F., 1958.—" Schistosomiasis as related to hepatosplenomegaly in Puerto Rico." **7** (2), 240–241.

†s. MALDONADO, J. F., 1958.—" The fecal egg output of *S. mansoni* in mice." **7** (2), 241.

†t. NAIMARK, D. H., BENENSON, A. S., OLIVER-GONZÁLEZ, J. & RITCHIE, L. S., 1958.—" Studies of schistosomiasis mansoni in primates. (2) Observations on acquired resistance." **7** (2), 241.

(5o) Mice, in which fatty-liver disease had been produced by a ration deficient in choline and methyl-group precursors, were each exposed to 75 *Schistosoma mansoni* cercariae and autopsied eight weeks later. The number of worms recovered was 30% fewer than from the controls. The worms were poorly developed and had produced few eggs. The liver showed massive accumulation of stainable fat within the parenchymal cells and early signs of fibrosis but eggs were absent and there was little or no schistosome pigment in the Kupffer cells. R.T.L.

(5p) Mice were experimentally infected with *Schistosomatium douthitti* cercariae. In early infections the intestinal muscularis mucosa confined the eggs to the submucosa. No ulceration of the villi was detected. In male infections of the liver and lungs there were accumulations of mononuclear cells around the veins and the spleen was markedly congested. There were typical pseudotubercles around the eggs and adults in the lungs. No marked change could be detected in the immune host when challenged with cercariae. R.T.L.

(5q) Varices developed on the serous surface of the oesophagus along with hepatomegaly, splenomegaly and portal hypertension in mice infected with *Schistosoma mansoni* cercariae twelve weeks previously. The portal pressure was twice that in controls. Eggs in the portal area were surrounded by inflammatory reaction but there were no generalized fatty changes. R.T.L.

(5r) From a comparison of the incidence of schistosomiasis in Puerto Rican patients with hepatosplenomegaly and in those without, it is concluded that schistosomiasis is a major predisposing factor in organ enlargement. R.T.L.

(5s) The faeces of mice exposed to infection with 50 cercariae of *Schistosoma mansoni* contained $41{\cdot}9 \pm 16{\cdot}1$ eggs per ml. per female worm. The average number of fully mature females was 3·3 per animal. The proportion of males to females was four to one. R.T.L.

(5t) The faecal egg count of three monkeys reached a maximum in 100 to 150 days after exposure to 1,000 *Schistosoma mansoni* cercariae and declined fairly rapidly. Three subsequent exposures to 500 cercariae were made at intervals of 15 weeks between the 650th and 900th day but no increase in the egg counts followed and two of the monkeys ceased to pass eggs on the 550th and 950th day respectively. A further challenge by 5,000 cercariae on the 970th day did not alter the egg recovery. At autopsy six days later no worms were found in two of the monkeys and in the third animal 27 adults and 421 immature worms were recovered. A second lot of three received 26 exposures each of 25 to 50 cercariae at monthly intervals. In two the egg counts increased until about the 400th day and then sharply declined. The third animal died of schistosomiasis after the eleventh exposure. In a third lot the resulting egg counts from one or two exposures to 500 cercariae combined with a series of light exposures suggested the existence of varied levels of natural resistance. Challenges with 5,000 cercariae did not renew or increase the egg output during the following 85 to 100 days. Autopsies following a second challenge of 5,000 cercariae disclosed few or no adults but numbers of immature worms and schistosomulae had survived. R.T.L.

†Abstract of paper presented at the 6th Annual Meeting of the American Society of Tropical Medicine & Hygiene, Philadelphia, October 30 to November 2, 1957.

5—American Journal of Tropical Medicine and Hygiene (cont.)

†u. SLEEMAN, H. K., BURKE, J. C. & KENT, J. F., 1958.—" Physicochemical and serologic studies of *Schistosoma mansoni* antigens." **7** (2), 241.

†v. SHOOKHOFF, H. B., EINHORN, A., DWORK, K. G. & FRITSCH, A., 1958.—" Treatment of *Schistosoma mansoni* infection in children with leucanthone hydrochloride (Nilodin)." **7** (2), 242.

†w. HERNANDEZ, A. & RITCHIE, L. S., 1958.—" Life history of *Australorbis glabratus* as observed under laboratory conditions." **7** (2), 242.

†x. BRENES, E., RADKE, M. G. & RITCHIE, L. S., 1958.—" Effects of crowding on *Australorbis glabratus* (Say) as observed under laboratory conditions." **7** (2), 242.

†y. CHERNIN, E., 1958.—" Streptomycin-induced inhibition of growth and reproduction in *Australorbis glabratus*." **7** (2), 242–243.

†z. HSÜ, H. F. & HSÜ, S. Y. LI, 1958.—" On the strain characteristics of *Schistosoma japonicum* from two isolated endemic areas in Japan." **7** (2), 243.

†ba. YOELI, M., ALGER, N. & MOST, H., 1958.—" Studies in filariasis. I. The behaviour of microfilariae of *Dirofilaria immitis* in the wax moth larva (*Galleria mellonella*)." **7** (2), 249.

†bb. MACDONALD, E. M. & SCOTT, J. A., 1958.—" The persistence of acquired immunity to the filarial worms of the cotton rat." **7** (2), 249.

†bc. BUMBALO, T. S., PLUMMER, L. J. & WARNER, J. R., 1958.—" The treatment of enterobiasis in children. A comparative study of piperazine (Antepar) and pyrrovinyquinium chloride (Vanquin)." **7** (2), 255.

(5u) When desiccated *Schistosoma mansoni* adults were extracted with anhydrous ether, components which reacted with syphilitic sera were removed without affecting reactivity with homologous antiserum. The specific complement-fixing fraction appeared to be conjugated protein resistant to pepsin and trypsin. Two antigens were obtained by fractionation by a modified Cohn's method 10, viz., a non-dialysable component resistant to desiccation and containing 30% of the original N and 50% of the P and a component labile to desiccation which retained 2% of the original N and 10% of the P. Both exhibited specific reactivity with homologous antiserum. R.T.L.

(5v) The statistical data presented suggest that lucanthone, at 20 mg. per kg. bodyweight daily for seven days, is an effective therapy for children with *Schistosoma mansoni* infection. R.T.L.

(5x) Data are presented which show that the crowding of *Australorbis glabratus* affects their survival, rate of growth, age of onset of egg-laying and rate of reproduction under laboratory conditions. R.T.L.

(5y) The addition of 50 μgm. to 100 μgm. per ml. of streptomycin sulphate to aquarium water in which *Australorbis glabratus* was being maintained immediately caused convulsive gyrations which lasted for two to four days and almost complete inhibition of growth and reproduction. R.T.L.

(5z) In experimentally infected mice no significant differences in the prepatent period or in the size and shape of the eggs were observed between a substrain of *Schistosoma japonicum* from Yamanashi on Honshu Island and one from Kurume on Kyushu Island. R.T.L.

(5ba) When heparinized blood containing large numbers of *Dirofilaria immitis* microfilariae was injected into wax moth larvae kept at 27°C. to 30°C. they developed to the "sausage" stage on and after the fourth day but no pre-infective or infective larvae were obtained. R.T.L.

(5bb) When cotton-rats which had been infected with *Litomosoides carinii* at two to 12 months of age were given challenging infections 10 to 18 months later the growth of the challenging infection was retarded in those animals which still harboured some live worms but little or no retardation of growth occurred in those in which only dead worms were found at autopsy. R.T.L.

(5bc) [For abstract of fuller account of this work see No. 5m above.]

†Abstract of paper presented at the 6th Annual Meeting of the American Society of Tropical Medicine & Hygiene, Philadelphia, October 30 to November 2, 1957.

5—American Journal of Tropical Medicine and Hygiene (cont.)

†bd. BROWN, H. W. & STERMAN, M. M., 1958.—" Chemotherapy of strongyloidiasis with pyrrovinyquinium (Vanquin)." **7** (2), 255–256.

†be. JUNG, R. C. & PACHECO, G., 1958.—" Relationship of clinical features to immunologic reactions in visceral larva migrans." **7** (2), 256.

†bf. STERMAN, M. M. & BROWN, H. W., 1958.—" *Echinococcus* in man and dog in the same household." **7** (2), 256.

†bg. HSÜ, H. F. & HSÜ, S. Y. LI, 1958.—" On the human helminthic infections in Changua, Taiwan, China." **7** (2), 256.

(5bd) Approximately 80% of a group of *Strongyloides stercoralis* patients [number not given] remained negative for several months after being treated with 50 mg. of pyrrovinyquinium thrice daily for seven days but many of the patients had nausea occasionally accompanied by abdominal pain and by vomiting. R.T.L.

6—American Journal of Veterinary Research.

a. ENZIE, F. D., WILKENS, E. H. & COLGLAZIER, M. L., 1958.—" The use of piperazines as anthelmintics for swine." **19** (70), 19–24.

b. LEVINE, N. D., KANTOR, S. & TAYLOR, G. D., 1958.—" Nematocidal activity of some organic phosphorus compounds against horse strongyle larvae *in vitro*." **19** (71), 299–303.

c. WEBER, T. B., 1958.—" The complement-fixing antibody response of cattle infected or exposed to reinfection with *Dictyocaulus viviparus*." **19** (71), 338–344.

d. KELLEY, G. W., OLSEN, L. S. & HOERLEIN, A. B., 1958.—" The influence of diet on the development of *Ascaris suum* in the small intestines of pigs." **19** (71), 401–404.

(6a) Although a dosage of at least 50 mg. of piperazine per lb. body-weight is markedly effective against Ascaris and oesophagostomes when administered within 24 hours to pigs individually, it is less effective when given to the animals in groups under field conditions and according to the prevalent practice. This is ascribed to the inability of one or two of the animals in the group to obtain their proper share of the medicated food or water, to differences in its palatability to individual animals, to variations in water consumption and to differences in palatability of the different preparations on the market. R.T.L.

(6b) Preliminary tests for nematicidal activity of organic phosphorus compounds against horse strongyle larvae have already been described by Levine *et al.* [for abstract see Helm. Abs., **25,** No. 51a]. The present report covers the examination *in vitro* of a further 173 related substances tested at 0·01 M concentration or less, in horse faeces. Of these, 69 possessed nematicidal properties at concentrations between 0·01 M and 0·00005 M. In the phosphorotrithious series maximum activity was obtained with the tri-*n*-propyl esters; compounds of lower molecular weight were less active and those of higher molecular weight completely inactive. In the trichlorophenyl phosphoric acid series isomeric variation was seen to have a profound effect upon activity and may provide a clue to the mode of action. It is suggested that such compounds compete with acetylcholine and related substances for cholinesterases. Whilst derivatives of phosphoric acids were active, the phosphorothionate analogues were not. Whilst the latter are believed to owe their insecticidal properties to their conversion to phosphates it is suggested that the nematode larvae do not possess the appropriate enzyme systems for such conversion and are therefore unaffected. O.D.S.

(6c) The complement fixation response of 20 calves and older animals which had been exposed once, twice or on numerous occasions to *Dictyocaulus viviparus* larvae, was compared with seven control animals. The titre was shown to rise slightly over the first 12 days following exposure and to reach a peak at about the 16th day when this level was maintained as a plateau for about 48 days. No significant difference was found between the titres after one or two exposures. The persistence of antibody was estimated in the post-plateau period,

†Abstract of paper presented at the 6th Annual Meeting of the American Society of Tropical Medicine & Hygiene, Philadelphia, October 30 to November 2, 1957.

i.e. after nine weeks or more, and it was shown that animals which had been repeatedly exposed had the highest titres, the two animals which had been passively immunized the lowest, and the remainder were ranged intermediately. K.H.

(6d) Kelley, Olsen & Hoerlein describe experiments in which infective *Ascaris suum* eggs were fed to colostrum-deprived, disease-free pigs. Larvae became established more readily in the intestines of pigs fed on a diet of rolled oats than in pigs receiving a milk diet. Nevertheless, in the oat-fed pigs only a fraction of the larvae migrating through the host were able to establish themselves in the intestine. Although severe respiratory dysfunction was observed during the second week after infection in the milk-fed pigs, no adult worms were present in the intestine at later necropsy. Evidence was found that age immunity to *Ascaris suum* becomes established in pigs between the 9th and 13th weeks of life. J.M.W.

7—American Midland Naturalist.

a. CHENG, T. C., 1958.—" Studies on the trematode family Dicrocoeliidae. I. The genera *Brachycoelium* (Dujardin, 1845) and *Leptophallus* Lühe, 1909, (Brachycoeliinae)." **59** (1), 67–81.

b. WILSON, W. D., 1958.—" The guinea worm, *Dracunculus insignis* (Leidy 1858) Chandler 1942, in a raccoon, *Procyon lotor*, from Michigan, a new location." **59** (1), 256.

(7a) Cheng gives succinct descriptions and figures for the nine species of *Brachycoelium* which he recognizes as valid and for *B. elongatum* n.sp. from the salamanders *Desmognathus q. quadrimaculatus*, *D. phoca* and *Plethodon glutinosus*. Its main characteristics are its body-length (1·72–3·10 mm.) and the range of the vitellaria which reach the mid-region of the caeca anteriorly and the anterior testes posteriorly. As *Leptophallus* closely approximates *Brachycoelium* in body shape and size and in the arrangement of all the internal organs it is placed in the Brachycoeliinae from which it was omitted by Byrd (1937). R.T.L.

8—Annals of Applied Biology.

a. WALLACE, H. R., 1958.—" Movements of eelworms. I. The influence of pore size and moisture content of the soil on the migration of larvae of the beet eelworm, *Heterodera schachtii* Schmidt." **46** (1), 74–85.

b. WALLACE, H. R., 1958.—" Movements of eelworms. II. A comparative study of the movement in soil of *Heterodera schachtii* Schmidt and of *Ditylenchus dipsaci* (Kühn) Filipjev." **46** (1), 86–94.

c. WIDDOWSON, E. & WILTSHIRE, G. H., 1958.—" The potato-eelworm hatching factor." **46** (1), 95–101.

(8a) Measurements of mobility of the beet eelworm in soil show that maximum speeds are attained when the channels in the soil are about the same diameter as the eelworm. Maximum speeds also occur when pores in the soil are emptied of water, but where there are relatively large amounts of water where particles touch. There is an optimum water film thickness for mobility, of about 2–5 μ. Movements between soil particles and in water films show similarities in that maximum speeds occur when lateral movement is at a minimum, each part of the body following the part immediately in front of it. It is suggested that the curve showing the relationship between the suction and moisture content (moisture characteristic) supplies most of the information about physical properties of the soil in relation to eelworm movement. H.R.W.

(8b) A comparison of the mobilities of *Heterodera schachtii* larvae and *Ditylenchus dipsaci* in soil shows that there is a simple relationship between eelworm length and soil particle size for maximum speed. Both species achieved greatest mobility when there were few pores smaller in diameter than the eelworm width, when the pore diameter was narrow enough to restrict lateral movement and when the tortuosity of the channels between particles was such that the body form of the eelworm had waves of long wave-length and short amplitude. The optimum temperature for movement was 15°C. for *H. schachtii* and 15–20°C. for *D. dipsaci*. H.R.W.

(8c) Investigations into the properties of the hatching factor in potato-root diffusate (R.D.) are described. Acidified R.D. was stirred with 1 gm. of powdered charcoal per litre and about 60% of the active factor recovered by eluting the charcoal with acetone. It was purified by transfer from acid solution to butanol and then bicarbonate. Factor was stable at *p*H 1–9 at room temperature, to boiling for 5 minutes at *p*H 4, or in 0·75 N sulphurous acid, but inactivated immediately by caustic alkali, and after 5 minutes by boiling in I N hydrochloric acid. Its acidic nature was shown by movement towards the anode on paper electrophoresis and adsorption on anion exchange resins. Active fractions from paper partition chromatograms were coloured yellow and fluoresced blue under ultra-violet light. Titration with sodium hydroxide indicated a *p*K of 5·1 and an equivalent weight of 225. Potato-root eelworm cysts were used in the assay technique which gave results of an accuracy of ±10% in three weeks. E.W.

9—Annals of Tropical Medicine and Parasitology.

a. THOMAS, T. C. E., 1958.—" The incidence of the microfilariae of *Acanthocheilonema perstans* in the population of Sierra Leone." **52** (1), 1–4.
b. DUKE, B. O. L., 1958.—" Studies on the biting habits of *Chrysops*. V. The biting-cycles and infection rates of *C. silacea*, *C. dimidiata*, *C. langi* and *C. centurionis* at canopy level in the rain-forest at Bombe, British Cameroons." **52** (1), 24–35.
c. NICHOLAS, W. L. & HYNES, H. B. N., 1958.—" Studies on *Polymorphus minutus* (Goeze, 1782) (Acanthocephala) as a parasite of the domestic duck." **52** (1), 36–47.
d. GIBSON, T. E., 1958.—" The transmission of trichinosis by butchers' knives." **52** (1), 48–50.
e. NEWSOME, J., 1958.—" Species-specific serological tests for Bilharzia." **52** (1), 82–86.
f. EDESON, J. F. B. & WHARTON, R. H., 1958.—" Studies on filariasis in Malaya: treatment of *Wuchereria malayi*-carriers with monthly or weekly doses of diethylcarbamazine (Banocide)." **52** (1), 87–92.
g. WHARTON, R. H. & SANTA MARIA, F. L., 1958.—" Studies on filariasis in Malaya: the effect of residual insecticides on *Mansonia* (*Mansonioides*) *longipalpis*." **52** (1), 93–102.
h. LAVOIPIERRE, M. M. J., 1958.—" Studies on the host-parasite relationships of filarial nematodes and their arthropod hosts. I. The sites of development and the migration of *Loa loa* in *Chrysops silacea*, the escape of the infective forms from the head of the fly, and the effect of the worm on its insect host." **52** (1), 103–121.

(9a) Examination of blood films from the civil population of the town, prison and rural area of Freetown and of 20 coastal villages confirmed that the incidence of *Acanthocheilonema perstans* is low in Sierra Leone. R.T.L.

(9b) Whereas the biting activity of *Chrysops silacea* and *C. dimidiata* (Bombe form) is diurnal, with maxima in the morning and afternoon, that of *C. langi* and *C. centurionis*, which never feed on man, begins shortly before sunset. The incidence of *Loa* infection in the British Cameroons in *C. silacea* was 4·7% and in *C. dimidiata* 3%. That in *C. langi* was 12·6% and in *C. centurionis* was 31·8%. It is considered that *C. langi* and *C. centurionis* feed almost entirely on monkeys and are probably the natural vectors of the simian parasite. R.T.L.

(9c) *Polymorphus minutus* (Goeze, 1782) is a wide-spread parasite of aquatic birds in Great Britain but has rarely been reported from domestic ducks there. The life-cycle has been followed in the laboratory using naturally infected *Gammarus pulex*, *G. duebeni* and *G. lacustris*. Ducks were infected by feeding them with cystacanths dissected from these shrimps. Starvation of the ducks for one or two days often resulted in the elimination of the worms from the gut. A superimposed infection developed normally in the presence of a previous infection. The various localities in England, Wales, Ireland and the Isle of Man where infected *Gammarus* spp. were collected are tabulated. R.T.L.

(9d) Cysts of *Trichinella spiralis* adhered in small numbers to butchers' knives used to make multiple incisions into the muscles of experimentally infected guinea-pigs, indicating that care should be taken by butchers and housewives to cleanse their implements after using them on pork. R.T.L.

(9e) Newsome describes various experiments on methods of obtaining and storing live schistosome eggs and of using them as antigens in the circumoval precipitate test, introduced by Oliver-González, as a species-specific test for the serological diagnosis of schistosome infections. R.T.L.

(9f) *Wuchereria malayi* carriers had their microfilarial counts reduced by 99% after receiving weekly doses of 4·5 mg. or 6 mg. per kg. body-weight of diethylcarbamazine for six weeks and the counts continued to fall for several months afterwards. Those receiving 4 mg. or 6 mg. per kg. once monthly were negative six months after the last dose. Although there was a sharp febrile reaction within 24 hours after the first dose it seldom occurred after the second dose. It is concluded from these trials that in a mass campaign six weekly or monthly doses of about 5 mg. per kg. would reduce the human microfilarial reservoir to a very low level, but it is pointed out that *W. malayi* also exists in forest monkeys and domestic cats. R.T.L.

(9g) Observations in East Pahang on the effect of residual insecticides in reducing or preventing the transmission of *Wuchereria malayi* indicated that dieldrin applied at the rate of 100 mg. per sq. ft. killed 100% of the principal vector *Mansonia* (*Mansonioides*) *longipalpis* for two months and maintained a kill of over 50% for 25 to 28 weeks. With gamma BHC at 100 mg., the death rate which was initially 100% fell below 50% in the fourth month. The effect on *M. uniformis* and *M. annulatus* of which small numbers were present was very similar. A kill of more than 80% of the few *Culex pipiens fatigans* found in huts was recorded five to six months after treatment by dieldrin at the rate of 100 mg. per sq. ft. R.T.L.

(9h) Lavoipierre now describes and illustrates in greater detail his histological observations on the migration of the larvae of *Loa loa* in *Chrysops silacea*. The developmental forms were observed in the fat body of the abdomen and to a lesser extent in the thorax and head, and their emergence from the head was mostly by rupturing the delicate labio-hypopharyngeal membrane. Their migration causes injury to the insect's flight muscles, the head muscles and retina, which must affect its range of flight, its capacity to feed and its reaction to light. R.T.L.

10—Atti della Accademia Nazionale dei Lincei. Rendiconti. Classe di Scienze Fisiche, Matematiche e Naturali. Rome.

a. BIOCCA, E. & FERRETTI, G., 1958.—" *Archeostrongylus italicus* gen.nov. et sp.nov., nuovo nematode borsato parassita di *Hystrix cristata* in Italia Centrale." Serie 8, **23** (6), 467–470.
b. BIOCCA, E. & LEROUX, P. L., 1958.—"Suddivisione del genere *Ancylostoma* (Dubini, 1843), in quattro sottogeneri." Serie 8, **23** (6), 470–477.
c. MANDAHL-BARTH, G., 1958.—" La validità di *Bulinus* (*Physopsis*) *abyssinicus* (Martens), l'ospite intermedio di *Schistosoma haematobium* in Somalia." Serie 8, **23** (6), 478–481.

(10a) Biocca & Ferretti describe a small bursate nematode (less than 2 mm. long) from the intestine of *Hystrix cristata* from central Italy. Because the morphological characters of this parasite appear to be somewhat primitive it has been named *Archeostrongylus italicus* n.g., n.sp. The characters of the male bursa indicate relationships with the Strongylata, but the presence of a simple buccal capsule without a corona radiata, the smallness of the bursa and its atypical ray structure, and the presence of large embryos in the uterus make it difficult to assess accurately the affinities of the new form. C.W.

(10b) Using the characters of the teeth in the buccal capsule and the rays in the male bursa, Biocca & LeRoux have subdivided the genus *Ancylostoma* into four subgenera; two of these were proposed by Lane in 1916 (*Ancylostoma* and *Ceylancylostoma*) and the other two are new, *Afrancylostoma* and *Amerancylostoma*. *A. buckleyi*, *A. caninum*, *A. conepati*, *A. duodenale*, *A. martinagliai*, *A. paraduodenale*, *A. poliodontatum* and *A. tubaeforme* are included in *A.* (*Ancylostoma*), *A. ceylanicum* and *A. malayanum* in *A.* (*Ceylancylostoma*), *A. braziliense* in *A.* (*Afrancylostoma*), and *A. pluridentatum* in *A.* (*Amerancylostoma*). C.W.

(10c) Mandahl-Barth provides a detailed description of *Bulinus* (*Physopsis*) *abyssinicus* in support of his contention that it is a distinct species. A brief review of the characters of taxonomic value in this group of snails is given. The male copulatory organ in *B.* (*P.*) *abyssinicus* is similar to that in *B. nasutus* but in well developed adults of the former species the penis sheath is narrower. The upper whorls of the shell are distinctly shouldered and the microsculpture consists of coarse corrugations instead of the more usual fine spiral pattern in other species of this group. *B.* (*P.*) *abyssinicus* is confirmed as an intermediate host for *Schistosoma haematobium* in Somalia. C.W.

11—Australian Journal of Agricultural Research.

a. GILES, J. E. & HUTTON, E. M., 1958.—" Combining resistance to the root-knot nematode, *Meloidogyne javanica* (Treub) Chitwood, and Fusarium wilt in hybrid tomatoes." **9** (2), 182–192.

(11a) Giles & Hutton report the production of tomato strains resistant to root-knot nematodes (*Meloidogyne javanica*) and Fusarium wilt (*Fusarium bulbigenum* var. *lycopersici.*) Four lines derived from *Lycopersicon peruvianum* bred in Hawaii for root-knot resistance were crossed in various ways with 12 Australian commercial varieties. Tests with the most virulent strain of Fusarium wilt showed all the Hawaiian lines to be highly resistant and that resistance was dominant. Resistance to the nematode varied in the different lines and was greatest in *L. peruvianum.* In some of the resistant hybrids it was observed that some seedlings had root-knot galls and females at the time of transplanting, but at maturity there was little galling. The mode of inheritance of nematode resistance was not clear; the progeny of resistant parents were not all resistant but all produced average yields while many of the susceptible control plants died. Of 55 crosses and backcrosses made, only two crosses and nine backcrosses were retained. These had good agronomic qualities and sufficient nematode resistance to be of use commercially. The hybrids ripened significantly earlier than the controls. The continuous growth of one of the resistant lines in the same plot of nematode-infested soil for five years resulted in the break-down of resistance. This is considered to be due to the selection and multiplication of nematode strains capable of infesting the resistant line. It will therefore be necessary to rotate crops in order to stop changes in the infectivity pattern of the nematode population. M.T.F.

12—Australian Veterinary Journal.

a. RIEK, R. F. & KEITH, R. K., 1958.—" Studies on anthelmintics for cattle: III. The efficiency of some piperazine compounds." **34** (1), 1–4.
b. GORDON, H. McL., 1958.—" The epidemiology of helminthosis in sheep in winter rainfall regions of Australia. 2. Western Australia." **34** (1), 5–19. [Discussion pp. 26–27.]
c. BANKS, A. W., 1958.—" Epidemiology of helminth infestation in sheep. South Australian aspects." **34** (1), 20–26. [Discussion pp. 26–27.]
d. OSBORNE, H. G., 1958.—" Ileal intussusception causing multiple losses in sheep." **34** (2), 42–43.
e. RIEK, R. F. & KEITH, R. K., 1958.—" Studies on anthelmintics for cattle: IV. The organic phosphorus compound 0,0-dimethyl 2,2,2,-trichloro-1-hydroxymethyl phosphonate (Bayer L13/59)." **34** (4), 93–103.
f. GORDON, H. McL., 1958.—" Studies on anthelmintics for sheep. Some organic phosphorus compounds." **34** (4), 104–110.
g. WINTER, H., 1958.—" Gastric strongyloidosis in kangaroos." **34** (4), 118–120.

(12a) Piperazine hydrate and piperazine-1-carbodithioic betaine were used in the treatment of 46 calves infected with a variety of nematodes. Drug efficiency was assessed on the basis of relative reduction in total egg counts per gramme of faeces and faecal cultures permitted identification of the larvae of the various species. Both piperazine preparations were highly effective against *Oesophagostomum radiatum.* The minimum effective dose of the hydrate was 3 gm. per 100 lb. body-weight; the carbodithioic betaine was not tested orally

at doses lower than 10 gm. per 100 lb. When given at 20 gm. per 100 lb. the hydrate was minimally effective against *Haemonchus placei* but was ineffective against *Trichostrongylus axei*, *Cooperia* spp. and *Bunostomum phlebotomum*. The carbodithioic betaine was ineffective against any of these species when given at 10–20 gm. per 100 lb. Premedication with sodium bicarbonate to close the oesophageal groove did not improve efficiency. Piperazine carbodithioic betaine given by intra-abomasal injection was highly effective against *H. placei*, *O. radiatum* and *Cooperia* spp. at a dose rate of 20 gm. per 100 lb. O.D.S.

(12b) Gordon presents data on the seasonal incidence of the more important gastro-intestinal nematodes of sheep in eight districts in Western Australia. The species of greatest importance were *Haemonchus contortus*, *Trichostrongylus* spp. and *Chabertia ovina*. The general pattern of seasonal changes, namely, increase in late winter and early spring, decline in late spring and early summer, and increase in late summer and early autumn, was similar in all districts and was related to the rainfall. The decrease in summer did not appear to be due to the development of immunity but to the climatic conditions which were unfavourable for the survival of the free-living stages. A plan for a seasonal scheme of drenching was outlined. The paper is illustrated by tables and numerous graphs. In the discussion of this paper and that by Banks [see following abstract] the effect of nutrition, the development of immunity and the desirability of regular drenching were mentioned. S.W.

(12c) In this paper Banks reports investigations into the problems of gastro-intestinal and lung nematodes, liver-fluke and *Cysticercus tenuicollis* in sheep in different districts of South Australia. In lambs, parasitic infection reached a peak after five to six months and then declined, with a strong residual immunity. There appeared to be no evidence that poor nutrition increased the severity of parasitic diseases. Regular drenching did not appear to be worth while and routine treatment of sheep over one year old was wasted. *Trichostrongylus* was the only parasite of regular importance. There was little prospect at present of controlling liver-fluke disease, which occurs in two different environments in South Australia. *Cysticercus tenuicollis* was found in sheep in at least one locality but in spite of spectacular liver damage there were no clinical signs of ill health. In the discussion Banks' observations were compared with those reported by Gordon [see preceding abstract]. S.W.

(12d) Osborne describes three outbreaks of ileal intussusception in sheep in the New England district of New South Wales. The cause of the outbreaks was not determined. Nodules of *Oesophagostomum columbianum* were present in all cases but their aetiological significance was in doubt. It is desirable to determine whether or not ileal intussusception in sheep in Australia occurs in the absence of this parasite. J.M.W.

(12e) 0,0-dimethyl-2,2,2-trichloro-1-hydroxyethyl phosphonate, an organo-phosphorus insecticide, was tested against experimental and natural nematode infections in cattle. High efficiency was obtained against *Haemonchus placei* and *Oesophagostomum radiatum* at a dose rate of 2 gm. per 100 lb. body-weight. At 5 gm. per 100 lb. the drug was also effective against *Bunostomum phlebotomum*, *Cooperia* spp. and *Trichostrongylus axei* in the small number of calves available for test with the last-named species. It is thought that premedication with sodium bicarbonate to close the oesophageal groove may produce increased efficiency against *Cooperia* spp. Of the five genera, *Cooperia* appeared to be the most resistant. The drug was also effective against the immature stages of most of the common nematodes of cattle. Considerable attention was given to toxicity studies. Toxicity at high dosage appears to be due to anti-cholinesterase activity. Of more than 200 calves dosed in the field at levels up to 5 gm. per 100 lb. none died; in the laboratory, dosage up to 12·5 gm. per 100 lb. has been given without loss except for one calf given 10 gm. per 100 lb. At the higher dose rates there was some temporary loss of appetite and looseness of the bowel with little retardation in weight

gain. It is thought that different types of feeding may affect toxicity and that until more experience has been gained it is recommended that the drug be used with considerable caution and preferably under veterinary supervision. O.D.S.

(12f) 0,0-dimethyl-2,2,2-trichloro-1-hydroxyethyl phosphonate, an organo-phosphorus insecticide, was tested against nematode infections in sheep. The drug was highly effective against *Haemonchus contortus* [wrongly referred to as "*H. columbianum*" in Table 2] at non-toxic dosage of 3 gm. to 5 gm. per 100 lb. body-weight. Effective action against *Trichostrongylus* spp. was obtained only if injected intra-abomasally or swallowed into the abomasum. At 3 gm. per 100 lb. the drug was ineffective against *Strongyloides papillosus*. At toxic levels the drug gave variable effects against *Oesophagostomum columbianum*. Toxic effects were produced at doses of 7·5 gm. per 100 lb. when given as a drench and 8 gm. per 100 lb. when given into the rumen. 3-chloro-4-methyl-7-oxycoumarine diethyl thiophosphoric acid was highly effective against *H. contortus*, *Trichostrongylus* spp. and *O. columbianum* when given by injection into the rumen at doses between 0·35 and 1·0 gm. per 100 lb. but was too toxic for use as an anthelmintic. 0,0-dimethyl-0-2,4,5-trichlorophenyl phosphorothioate was non-toxic but ineffective at 5 gm. per 100 lb. against *T. colubriformis*, *T. axei* or *O. columbianum*. At 10 gm. per 100 lb. it was very effective against *H. contortus* but was ineffective at 2 gm. per 100 lb. Gordon considers that increased activity may be achieved if closure of the oesophageal groove is effected by pre-treatment with copper sulphate and that if the rapid absorption into the rumen could be controlled, greater effectiveness could be obtained through higher dosage. O.D.S.

(12g) Winter reports an outbreak of strongyloidiasis, which caused a high mortality, in a group of pet kangaroos and wallabies. The nematodes, possibly a new species of *Strongyloides*, occurred mainly in the stomach, and eggs, adults and larvae were present. The histology of the lesions is described and illustrated by two photomicrographs. The nematodes are to be described elsewhere by Pearson. S.W.

13—Berliner und Münchener Tierärztliche Wochenschrift.

a. BOCH, J. & MATZKE, P., 1958.—" Vorkommen, Schadwirkung und Bekämpfung parasitischer Würmer bei Schweinen." **71** (9), 168–172. [English summary p. 172.]
b. ULLRICH, K., 1958.—" Behandlungsversuche mit einem parenteral verabreichbaren Leberegelmittel bei Schafen." **71** (11), 201–205. [English summary p. 205.]

(13a) Boch & Matzke report on a survey of the helminth parasites of 192 pigs at a pig testing station in Bavaria. *Oesophagostomum dentatum* was found in 26·0%, stomach worms (*Hyostrongylus*, *Physocephalus*, or *Strongyloides*) in 10·4%, *Globocephalus* in 1·6%, and *Ascaris lumbricoides* in 71·9%. Infection with two species was found in 18·2% of the pigs, with three species in 9·9%, and two animals harboured four species. Within the same groups, pigs free of helminths reached a weight of 110 kg. 24 days earlier than infected animals. When slaughtered 115 of the 192 pigs were found to have "parasitic interstitial hepatitis" which in most cases was caused by migrating Ascaris but was sometimes due to tapeworm infection. A series of experiments (which are to be more fully reported elsewhere) in which a total of 964 pigs were treated with piperazine adipate or citrate at a dosage of 250 to 300 mg. per kg. body-weight showed the drug to be almost 100% effective against Ascaris, 60% to 75% effective against *Oesophagostomum* and 50% to 60% effective against *Hyostrongylus*. A.E.F.

(13b) Ullrich reports on his trials with "Ecobol pro injectione" (an oil-in-water emulsion which contains 500 mg. carbon tetrachloride per ml.) against liver-fluke in sheep, 200 mg. of the effective substance per kg. body-weight, given intramuscularly, was found to be the optimum dosage and was effective in almost every case. There were no side effects. Even a dosage of 300 mg. per kg. produced no untoward symptoms apart from some disturbances of the liver parenchyma which were reversible. A.E.F.

14—Boletín Chileno de Parasitología.

a. BARBOSA, F. S. & BARBOSA, I., 1958.—" *Tropicorbis chilensis* from Santiago, Chile, a potential intermediate host of *Schistosoma mansoni*." **13** (1), 7–9. [Spanish summary p. 7.]
b. DONCKASTER, R. & HABIBE, O., 1958.—" Contribución al estudio de la infección por *Hymenolepis nana*. I. Sintomatología y eosinofilia relativa." **13** (1), 9–11. [English summary p. 9.]
c. WESTERMEYER, J., FAIGUENBAUM, J. & ROMERO, G., 1958.—" Un caso de distomatosis hepática complicado con empiema vesicular." **13** (1), 11–13. [English summary p. 11.]
d. GONZÁLEZ FOUQUET, H., 1958.—" Examen coprológico en ovejas." **13** (1), 13–14. [English summary p. 13.]

(14a) Barbosa & Barbosa have carried out experiments to determine the susceptibility of *Tropicorbis chilensis* to a Brazilian strain of *Schistosoma mansoni*. The results are tabulated and indicate that this snail is not a very efficient host for *S. mansoni*. Histological examination of specimens soon after penetration by miracidia showed the same type of host tissue reaction as has been previously described for other partially resistant species. The authors point out that despite the poor susceptibility of this host it might have epidemiological importance if *S. mansoni* were to be introduced into Chile for there are areas in Brazil where the disease is endemic and maintained by an equally poor host. C.W.

(14c) The gall-bladder of a woman in Santiago was removed in a state of empyema and six *Fasciola hepatica* were afterwards recovered from the common bile-duct. She was subsequently treated with 4 cg. of emetine hydrochloride and 1 mg. of strychnine daily for ten days and regained good health. M.McK.

(14d) For taking faecal samples from a flock of sheep González Fouquet recommends collecting the rectal contents of the ten healthiest and ten least healthy animals. Each sample, unless it can be examined within 24 hours, should be divided into two and one part be preserved by enclosing in the sample bottle a cotton wad soaked with five to ten drops of a solution of 25 gm. of paradichlorobenzol in 100 c.c. of paraffin. The cultivation of larvae from sheep faeces is described. M.McK.

15—British Journal of Radiology.

a. PATERSON, D. E., 1958.—" *Strongyloides* infestation of the jejunum." **31** (362), 102–103.

(15a) Paterson reports a case of strongyloidiasis in a male Indian farmer aged 34. He suggests that a possible cause of radiological abnormality in the small intestine associated with malabsorption of essential foodstuffs may be auto-infection in chronic strongyloidiasis. J.M.W.

16—British Medical Journal.

a. GOODWIN, L. G. & STANDEN, O. D., 1958.—" Treatment of ascariasis with various salts of piperazine." Year 1958, **1** (5063), 131–133.
b. GOODWIN, L. G. & STANDEN, O. D., 1958.—" Piperazine and male fern in expulsion of tapeworms." Year 1958, **1** (5063), 133–134.
c. GOODWIN, L. G. & STANDEN, O. D., 1958.—" Piperazine in treatment of hookworm infection." Year 1958, **1** (5063), 135.
d. ROGERS, E. W., 1958.—" Excretion of piperazine salts in urine." Year 1958, **1** (5063), 136–137.
e. EL SERAFY, G., 1958.—" Treatment of helminth infections." [Correspondence.] Year 1958, **1** (5073), 775.
f. ROELS-BROADHURST, D. M. & DEMAEYER, E. M., 1958.—" Treatment of helminth infections." [Correspondence.] Year 1958, **1** (5076), 944–945.

(16a) No significant variation was detected in the comparative efficacy of piperazine adipate, citrate or phosphate administered to 770 cases of Ascaris infection, predominantly schoolchildren, in the Gambia. 76% were cured by a single dose equivalent to 3 gm. of piperazine hexahydrate and 82%–89% by a 4 gm. dose. In 58 individuals treated with piperazine sebacate and 56 with piperazine stearate, 86% were cleared by a single dose

equivalent to 3 gm. of piperazine hexahydrate but neither of these two preparations could be adopted on account of their taste or bulk. For mass treatment piperazine citrate syrup was more useful than tablets on account of rapidity of administration, rigidity of control and its palatability. R.T.L.

(16b) Although the number of heads of *Taenia saginata* passed in the faeces after treatment with piperazine followed by male fern was slightly greater than after male fern alone the difference was not statistically significant. Piperazine did not cause the scolex to become detached from the mucous membrane. R.T.L.

(16c) A boy eight years old heavily infected with hookworm received 900 mg. of piperazine adipate thrice daily for seven days and a boy, aged 11 years, with a light infection received 1 gm. of piperazine phosphate thrice daily for seven days. In neither case was there any significant reduction in egg output but subsequent administration of tetrachlorethylene was effective. R.T.L.

(16d) Rogers describes a colorimetric method for the quantitative determination of piperazine in urine using Folin's amino-acid reagent (1:2-naphthoquinone-4-sulphonic acid). R.T.L.

(16e) In an area near Alexandria highly infested with ascariasis and ancylostomiasis, El Serafy has found that failure is likely with a single 4 gm. dose either of piperazine adipate or citrate. Better results were obtained by 16 gm. of piperazine spread over seven days but this failed in about 40% of his cases. Piperazine salts proved useless in ancylostomiasis. A combination of 3 ml. of tetrachlorethylene and 0·5 ml. of oil of chenopodium gave fairly good results in adults. R.T.L.

(16f) Experience in treating ascariasis in large numbers of African children with piperazine phosphate and citrate suggests that a prophylactic dose given every two to three months may suffice to render a large proportion of the population permanently free from Ascaris. It proved easier to spread the dosage over three successive days than to give it as a single large dose, especially to small children to whom the syrup proved more acceptable than tablets. R.T.L.

17—Bulletin de l'Académie Polonaise des Sciences. Classe II. Série des Sciences Biologiques.

a. STEFAŃSKI, W. & ŻEBROWSKI, L., 1958.—" Investigations on the transmission of Newcastle disease virus by *Ascaridia galli* and the pathogenic synergism of both agents." **6** (2), 67–72.
b. KAZUBSKI, S. L., 1958.—" *Cerebrofilaria caprimulgi* nov.gen., nov.spec., (Nematoda: Filarioidea), a parasite from the brain of the nightjar *Caprimulgus europaeus* L." **6** (2), 73–78.
c. KISIELEWSKA, K., 1958.—" The life cycle of *Choanotaenia crassiscolex* (Linstow, 1890) (Dilepididae) and some data relating to the formation of its cysticercoids." **6** (2), 79–84.

(17a) From an experimental study, using five-week-old Sussex chicks as host animals, Stefański & Żebrowski conclude that *Ascaridia galli* is not a vector of the Newcastle disease virus. Chicks infected with *A. galli* and with the virus survived longer than those infected with the virus alone; it is possible that in this way the nematode favours the perpetuation of the virus. Attempts to demonstrate virostatic properties in the nematodes and in their metabolic products were unsuccessful. Possible explanations of the prolongation of survival in the nematode-infected chicks are discussed. S.W.

(17b) Kazubski describes and figures *Cerebrofilaria caprimulgi* n.g., n.sp. from the brain of *Caprimulgus europaeus*. *Eucamptus obtusus* and *Aprocta semenovi* are the only two members of the Filarioidea hitherto recorded from this host. The presence of a buccal capsule, the division of the oesophagus into two parts and the two spicules being equal in length distinguish the new genus. Its systematic position is discussed. S.W.

(17c) Kisielewska has found cysticercoids of *Choanotaenia crassiscolex* in the following snails in the Białowieza National Park: *Goniodiscus ruderatus*, *Cochlicopa lubrica*, *Eulopa fruticum*, *Zonitoides nitidus*, *Vitrea contracta*, *Vitrina pellucida*, *Succinea putris* and an unidentified species of the Clausilidae. *V. pellucida* was the most heavily infected; cysticercoids at various stages of development were recovered and are described and figured. All the development which takes place in the intermediary occurs within the cuticular membrane. A footnote states that Kazubski has found cysticercoids of *Choanotaenia crassiscolex* in *V. pellucida*, *Schistophallus orientalis* and *Isognomostoma isognomostoma* in the neighbourhood of Sanok. S.W.

18—California Agriculture.

a. LOWNSBERY, B. F. & SHER, S. A., 1958.—" Root-lesion nematode on walnut." **12** (5), 7, 12.
b. RASKI, D. J. & LEAR, B., 1958.—" Control of sugar-beet nematode." **12** (5), 8, 12.

(18a) Pre-planting fumigation with D-D, EDB (Dowfume W85) and DBCP (Shell Nemagon) of land on which walnuts were later planted, showed that on sandy silt loams with moisture equivalents of 9–14% and on clay loam with moisture equivalent of 26·7%, fumigation had a greatly beneficial effect in reducing populations of *Pratylenchus penetrans*, with consequent improvement of tree growth compared with untreated controls. The varieties of walnut tested were *Juglans hindsii* and *J. hindsii* × *J. regia*. Annual treatments of the soil, in which the tree seedlings were growing, with DBCP, continued their good growth. The trees were tolerant of DBCP in doses inimical to the nematodes. J.B.G.

(18b) Results of field tests with D-D and Nemagon and preliminary tests with Vapam indicate that chemical control of *Heterodera schachtii* on sugar-beet in California, where this crop is usually grown on clay loams or clays, is not an economic proposition. R.D.W.

19—California Fish and Game.

a. WALES, J. H., 1958.—" Two new blood fluke parasites of trout." **44** (2), 125–136.

(19a) About 300,000 trout, *Salmo gairdnerii kamloops* and *S.g. gairdnerii* at the Darrah Springs Hatchery, California in 1955 and about 5,000 *Salmo clarkii henshawi* at the Klamath Hatchery, Oregon in 1957 died from massive invasion of the gills by eggs of blood flukes now described for the first time. In *Sanguinicola davisi* n.sp. from *Salmo gairdnerii* the spindle-shaped adult is about 8·5 mm. with three or four rows of spines extending almost to the anterior and posterior ends of the body, the remainder of which is free from spines. The eggs are oval without lateral projections and the ootype contains only one egg. The molluscan intermediary is presumably *Oxytrema* (*Goniobasis*) *circumlineata*. *Sanguinicola klamathensis* n.sp. in *Salmo clarkii henshawi* measures 2·45 mm. to 3·15 mm. in length and has two longitudinal rows of heavy spines extending almost its whole length. The body is also covered with very small spines. The eggs are spherical or subspherical and several may be present in the ootype. A cercaria of lophocercous furcocercous type, found in molluscs of the genus *Fluminicola* is presumed to be that of *S. klamathensis*. R.T.L.

20—Canadian Journal of Botany.

a. MOUNTAIN, W. B. & BOYCE, H. R., 1958.—" The peach replant problem in Ontario. V. The relation of parasitic nematodes to regional differences in severity of peach replant failure." **36** (1), 125–134.
b. MOUNTAIN, W. B. & BOYCE, H. R., 1958.—" The peach replant problem in Ontario. VI. The relation of *Pratylenchus penetrans* to the growth of young peach trees." **36** (1), 135–151.

(20a) Although some 25 nematode genera occur in Ontario peach soils, only one species is sufficiently closely associated with peach replant failure to be a potential cause of the disease. This species, *Pratylenchus penetrans*, was considerably more prevalent in Essex County peach soils (where the problem is much more serious) than in the Niagara Peninsula, although the

two regions have similar climates. Soils of finer texture, such as prevail in the Peninsula, were shown to limit populations of *P. penetrans*, and this effect of soil particle size on the nematode may explain the difference in the replant problem in the two areas. R.D.W.

(20b) Further evidence indicates that *Pratylenchus penetrans* may be a causative organism of the peach replant disease [see preceding abstract]. *P. penetrans* was the first nematode to attack newly developing peach roots, ectoparasites appearing later. Of these, *Paratylenchus* sp. predominated, others found including *Tylenchorhynchus claytoni*, *Criconemoides* sp. and *Trichodorus* sp. In the Niagara district, where *Paratylenchus* is much more numerous than *Pratylenchus*, the replant problem is less severe than in Essex County, where *Pratylenchus* is more prevalent. Control of *Pratylenchus* by soil nematicides was associated with improved growth of peach seedlings. The disease decreases in severity as the "rest" interval between removing old trees and replanting is increased. R.D.W.

21—Canadian Journal of Zoology.

a. PREMVATI, 1958.—" Studies on *Strongyloides* of primates. I. Morphology and life history of *Strongyloides fülleborni* von Linstow, 1905." **36** (1), 65–77.
b. MULVEY, R. H., 1958.—" Parthenogenesis in a cyst-forming nematode, *Heterodera trifolii* (Nematoda: Heteroderidae)." **36** (1), 91–93.
c. LAIRD, M., 1958.—" Parasites of South Pacific fishes. II. *Diplectanum melanesiensis* n.sp., a monogenetic trematode from Fiji and the New Hebrides." **36** (2), 167–173.
d. PREMVATI, 1958.—" Studies on *Strongyloides* of primates. II. Factors determining the 'direct' and the 'indirect' mode of life." **36** (2), 185–195.
e. MONTREUIL, P. L., 1958.—" *Corynosoma magdaleni* sp.nov. (Acanthocephala), a parasite of the gray seal in Eastern Canada." **36** (2), 205–215.
f. MONTREUIL, P. L., 1958.—" Relaxation and fixation of Acanthocephala." **36** (2), 263–264.

(21a) Following a detailed and illustrated description of the morphology of the parasitic females of *Strongyloides fülleborni* in rhesus monkeys, from India, Premvati gives an account, for the first time, of the development of the eggs of these parasitic females into the free-living males and females and of the development of the eggs of the latter into infective larvae. There is only one generation of free-living adults. No males occur in the parasitic generation. Under optimum conditions development is always heterogonic in this species. R.T.L.

(21b) The clover cyst nematode, *Heterodera trifolii*, was shown to be parthenogenetic and no male was found. The diploid number of chromosomes appeared to be twenty-four; there was no pairing of homologous chromosomes. J.J.H.

(21c) *Diplectanum melanesiensis* n.sp., which is figured from *Epinephelus merra* collected from coral pools in the New Hebrides and Fiji, is distinguished from its closest relatives *D. serrani* and *D. epinepheli* by its small size and the presence of squamodiscs. Of nine concentric rows of elongated dumb-bell-shaped rodlets the four innermost circlets are complete. R.T.L.

(21d) Under normal optimal conditions there is in *Strongyloides fülleborni* a definite alternation of a parthenogenetic parasitic stage and a single free-living sexual stage but the females of the free-living stage may be suppressed or replaced by infective larvae under sub-optimal conditions depending on the conditions under which the eggs of the parthenogenetic female hatch and the first-stage rhabditiform larvae, before the first moult, are spent. These conditions are shown to reside in the culture medium, viz., its *p*H, temperature, consistency and the food available. At *p*H 5 to *p*H 6 development is direct. At *p*H 7 to *p*H 9 it is indirect. In *S. stercoralis* the eggs hatch within the intestine and develop there under conditions unfavourable for development into free-living adults. If the first moult occurs within the host the larvae, after being passed in the faeces, can only develop into infective larvae but if they are passed out of the host before the first moult they then moult to become free-living adults. The eggs of the free-living females after fertilization, become infective larvae. Whether

developed directly or indirectly the infective larvae have female germ primordial cells and inside the host can only develop into parthenogenetic females. R.T.L.

(21e) *Corynosoma magdaleni* n.sp. from *Halichoerus grypus* and, infrequently, from *Phoca vitulina concolor*, resembles most closely in body form *C. strumosum* and *C. hadweni* but is much smaller in all its proportions. In length the male is about 4·2 mm. and the female 4·5 mm. The proboscis hooks are smaller but the number of rows is greater, there being usually 20 (17 to 23) with ten or eleven and rarely nine hooks per row. The spines on the trunk extend further posteriorly on the ventral surface of the hind-trunk. R.T.L.

(21f) Montreuil recommends Bailenger & Neuzil's solution, composed of 0·25 gm. menthol and 5 gm. Tween 80 made up to 100 c.c. with water, for relaxing Acanthocephala, followed by Demke's solution, made up of formalin 5 c.c., acetic acid 5 c.c., glycerin 10 c.c., ethyl alcohol 24 c.c. and distilled water 46 c.c. as a fixative. The specimens should however be put into cold, not boiling, Demke's solution and left for two hours. They can be stored in this fluid for long periods. The internal structures can be examined without further clearing. R.T.L.

22—Časopis Lékařů Českých.

a. KAMARÝT, P., 1958.—" Výskyt onemocnění *Strongyloides stercoralis* v okrese Nové Mesto nad Váhom." **97** (9), 288–290. [English, French & Russian summaries p. 290.]

23—Central African Journal of Medicine.

a. ALVES, W., 1958.—" Treatment of urinary bilharziasis with antimony dimercaptosuccinate (TWSb)." **4** (1), 15.

(23a) Twenty-five African schoolboys, 10–17 years of age and weighing 27–57 kg. were treated for urinary schistosomiasis by the intravenous injection of 0·4 gm. of antimony dimercaptosuccinate (TWSb) daily for four successive days. All were passing numerous viable eggs of *Schistosoma haematobium* on each of the two days prior to treatment. Follow-up examinations on six occasions between three and six weeks after treatment showed that the urines of all 25 boys were free of living schistosome eggs and only a few red blood corpuscles could be found in any of them. No side effects were observed except for one complaint of a metallic taste after the third injection. O.D.S.

24—Comptes Rendus des Séances de l'Académie des Sciences. Paris.

a. JOYEUX, C. & BAER, J. G., 1958.—" Le développement d'*Opisthioglyphe ranae* (Fröhlich), Trématode Plagiorchidé." **246** (4), 655–657.
b. ROMAN, E. A., 1958.—" La cortisone peut inhiber la résistance à la réinfestation des souris parasitées par des *Hymenolepis nana fraterna* adultes." **246** (9), 1468–1470.
c. CHABAUD, A. G. & BRYGOO, E. R., 1958.—" Filaire humaine et filaire de lémurien à Madagascar." **246** (9), 1470–1472.
d. CHABAUD, A. G. & BRYGOO, E. R., 1958.—" Cycle évolutif d'un nématode cosmocercide, parasite de grenouilles malgaches." **246** (11), 1771–1773.
e. RITTER, M. & RITTER, R., 1958.—" Caractères du cycle évolutif d'un *Meloidogyne*, nématode parasite des racines de la tomate *Lycopersicum esculentum* Mill." **246** (11), 1773–1776.
f. RITTER, M. & RITTER, R., 1958.—" Influence de l'âge de la plante-hôte sur le développement de *Meloidogyne incognita*, nématode phytoparasite." **246** (13), 2054–2056.

(24a) Joyeux & Baer give a preliminary account of their work on *Opisthioglyphe ranae* in Central France. *Limnaea ovata* was the most important intermediate host and was capable of carrying the infection through the winter; infections of very young snails produced cercariae but these were incapable of infecting the amphibians. *Rana esculenta* proved to be the only vertebrate which carried the infection from one season to the next, other amphibians either being refractory or losing the infection when they left the water for a more terrestrial mode of life. The cycle could be completed with two or three hosts. Using *Hyla arborea* the authors

studied the protection conferred by successive infections and found that if the trematodes resulting from the first infection had been evacuated the second infection developed normally. However, when the first infection had been maintained, a certain number of the cysts from the second infection liberated their metacercariae which penetrated the intestinal wall and re-encysted there. S.W.

(24b) Previous workers have shown that immediate, total premunition is normally evoked by the presence of the cestode *Hymenolepis nana fraterna* in rodents. However, in hosts simultaneously harbouring the nematode *Strongyloides* or a heavy bacterial infection, this premunition may be inhibited. Roman observed that white mice treated with hydrocortisone acetate and simultaneously harbouring *Strongyloides ratti*, became reinfested. To determine whether premunition was inhibited by the injected hormone or by the presence of *Strongyloides*, Roman experimented on six white mice harbouring adult *H. n. fraterna* but not infested with *Strongyloides*. All the mice were injected with hormone and 28 days after the initial infestation they were fed with a test meal containing cestode eggs. At autopsy, four mice were seen to be reinfested, showing cysticercoids at a state of development corresponding with the date of the test meal, in addition to the adult cestodes of the initial infestation. J.M.

(24c) Chabaud & Brygoo conclude that the two microfilariae recently described from Madagascar, i.e. *Dipetalonema petteri* Chabaud & Choquet, 1955 from *Lepilemur ruficaudatus*, and *Microfilaria bancrofti* var. *vauceli* Galliard & Brygoo, 1955 from man, are morphologically indistinguishable and that the species are probably identical. This cannot, however, be considered definite until the adults have been compared and they recommend retaining the name *vauceli* until this is possible. The lack of specificity observed in *D. petteri* and the epidemiology of the human filariasis support their contention. S.W.

(24d) Chabaud & Brygoo describe the morphology and development of the larval stages of *Aplectana* sp. from *Rana* (*Ptychadena*) *mascareniensis* in Madagascar. The first-stage larva hatches a few hours after the eggs are laid and is rhabditoid; it develops in the presence of very little oxygen and without feeding, increasing little in width and diminishing in breadth. The lateral alae appear after the first moult and the three lips, which are very distinct in the first-stage larva, disappear during the second stage. The infective larva has a rounded head with a tiny circular mouth. Infection is not through the skin but via the mouth and development then takes place rapidly in the intestine, the third moult occurring about the eighth day and the fourth about the 20th day. Many larvae pass into the gall-bladder and die; others get into the liver or heart where they become encapsulated but are capable of infecting other definitive hosts if they are eaten. The biology and systematic position of the Cosmocercoidea are discussed. S.W.

(24e) Root-knot disease is wide-spread in market and flower gardens and on weeds in the Mediterranean region of France. The authors describe the life-history of *Meloidogyne incognita* var. *acrita* on tomato, giving measurements of the different stages. The eggs are larger than normal for this species, averaging $102\mu \times 41\mu$. No males were seen on tomato but they were observed on lettuce and beetroot. The life-cycle took from 25 to 90 days depending on climatic conditions and on the physiological state of the host. M.T.F.

(24f) In this sequel to the preceding paper Ritter & Ritter investigate the effect of attack by *Meloidogyne incognita* var. *acrita* on tomatoes of different ages. Pot plants from 35 to 75 days old were inoculated with eggs and grown at 22°C. Females were found first on the 65 and 75-day-old plants 17 days after inoculation, on the 55-day-old plants 26 days after inoculation and on the 35-day-old plants 40 days after inoculation. The proportion of attacked plants was higher in the older than in the younger plants. An experiment carried out in the field gave similar results. It is concluded that to avoid undue damage to tomatoes growing in infested soil the grower should sow late, grow the plants rapidly and plant them out as young as possible. M.T.F.

25—Cornell Veterinarian.

a. KRULL, W. H., 1958.—" The migratory route of the metacercaria of *Dicrocoelium dendriticum* (Rudolphi, 1819) Looss, 1899 in the definitive host: Dicrocoeliidae." **48** (1), 17–24.

(25a) By feeding golden hamsters with ants (*Formica fusca*) naturally infected with metacercariae of *Dicrocoelium dendriticum*, Krull has confirmed Neuhaus' statement that the metacercariae migrate from the intestine into the common bile-duct in large numbers and reach all parts of the biliary system within an hour. The earlier view that they travel by the portal blood system is erroneous. R.T.L.

26—Current Science. Bangalore.

a. SEN, P., 1958.—" Periodicity of Wuchererian microfilariae in human blood." [Correspondence.] **27** (4), 135–136.

(26a) Sen has examined blood films, taken at various times of day and night, from persons infected with *Wuchereria bancrofti* and confirms that although microfilariae are not completely absent from the day blood the rate is only 3%, or less, of that observed in night blood. There appear to be two peaks in the microfilarial counts, one at midnight and the other at 4 a.m. S.W.

27—Deutsche Tierärztliche Wochenschrift.

a. BARKE, A., 1958.—" Untersuchungen zum anthelminthischen Wirkungsmechanismus des Piperazins." **65** (3), 65–68.
b. ENIGK, K., DÜWEL, D. & FEDERMANN, M., 1958.—" Zur Behandlung des Lungenwurmbefalles beim Rind." **65** (5), 122–125.
c. KURTZE, H., 1958.—" Parasitär verursachter Resorptionsikterus bei einem Schwein." **65** (5), 135.
d. PAVLOV, P., TATAROV, B., LAZAROV, E. & STOEV, P., 1958.—" Untersuchungen über die Lebensfähigkeit von Eiern und Larven parasitischer Nematoden im Silagefutter. 1. Mitteilung." **65** (9), 239–240. [English summary p. 240.]
e. ENIGK, K. & DÜWEL, D., 1958.—" Zur Wirksamkeit des 'Distan' beim Leberegelbefall." **65** (9), 240–242. [English summary p. 242.]

(27a) Barke has carried out *in vitro* experiments with *Fasciola hepatica* in order to determine the mechanism of the anthelmintic action of piperazine. In Ringer's solution piperazine first increases movement and then paralyses the liver-fluke, the effect being proportionate to the concentration of piperazine used. The paralysis is most pronounced when ox bile and cattle serum is added to the solution. A.E.F.

(27b) Enigk *et al.* have compared various treatments for lungworm infection in cattle. Two I.C.I. cyanacethydrazide preparations, Dictycide (given subcutaneously) and Helmox (mixed with fodder) were partially effective in animals with light or medium infections, but improvement was not noticed until two weeks after treatment and may have been partly due to feeding with concentrates: no improvement was found in heavily infected animals, some of which died. Piperazine hexahydrate, administered as an aerosol for 25 minutes, was ineffective, but a 30–35 minute treatment is recommended for heavily infected animals which cannot tolerate ascaridole. The latter, given as an aerosol, was more effective than the other three substances tried. A.E.F.

(27c) Kurtze describes a case of stoppage of the bile-duct by ascarids in a pig which had been slaughtered because it refused food. A.E.F.

(27d) Pavlov and others present their first report on studies carried out in Bulgaria on the effect of ensilagement on the viability of helminth ova and larvae. They found that non-embryonated Ascaris ova remain viable in silage for six months but do not develop: when

put in a favourable environment they developed to the embryonated stage. Embryonated Ascaris ova contained motile embryos after two months in silage but after three months embryos were immotile. After three months in silage Ascaris ova produced infection in two out of nine mice; after five months none of five mice were infected. *Dictyocaulus filaria* third-stage larvae, after 20 to 30 days in silage, were immotile and showed changes in structure. The authors conclude that there is no risk of infection from helminth ova or larvae after three months silage treatment. A.E.F.

(27e) Enigk & Düwel treated 60 cattle, having medium or heavy *Fasciola hepatica* infections, with Distan (a Bengen product containing 10% to 11% piperazine, 15% sodium glycocholate and 73% to 74% water). The dosage given was the maximum recommended by the manufacturers, and 27 animals were given a second dose after seven to eight days. In no case was infection reduced nor was there any clinical improvement. The authors also report that a veterinary surgeon who treated 400 cattle with a dosage 50% higher than that prescribed was also unable to find any effect on Fasciola infections. It is concluded that Distan is valueless against Fasciola in cattle. A.E.F.

28—East African Medical Journal.

a. WILLIAMS, A. W., 1958.—" Cor pulmonale in schistosomiasis." **35** (1), 1–5.
b. MACLEAN, G., WEBBE, G. & MSANGI, A. S., 1958.—"A report on a Bilharzia and molluscan survey in the Tanga district of Tanganyika." **35** (1), 7–22.
c. WRAY, J. R., 1958.—" Note on human hydatid disease in Kenya." **35** (1), 37–39.
d. MOORE, R. & ROBERTS, A., 1958.—" A short account of a medical survey in the Kisii district of Kenya." **35** (1), 41–44.

(28a) Williams reports a fatal case of cor pulmonale in schistosomiasis, remarkable in that it occurred in an area where schistosomiasis is seldom diagnosed. J.M.W.

(28b) A survey to determine the incidence of schistosomiasis and local molluscan intermediate hosts in a coastal district of Tanganyika is described. *Schistosoma haematobium* was found and *Bulinus* (*Physopsis*) *globosus* is incriminated as the probable principal intermediate host. The highest incidence of infection is reported in the 11–15 years age group with the rate being higher in boys than in girls. *S. mansoni* was found in seven cases and of these four had lived outside the area of the survey. No *Biomphalaria* spp. were found. Eggs of *S. haematobium* were found in 0·4% of the stools examined. C.W.

(28d) Moore & Roberts examined 500 people in the chiefdom of Wanjare, near Kisii, Kenya; and found no schistosomiasis, although 2·5% of adult urines showed red blood corpuscles. Microfilariae of *Onchocerca volvulus* occurred in 3·4% of adult males, 8% of adult females and 0·8% of children (under 15 years old). Stool examination revealed the following infection rates with intestinal helminths: Ancylostoma 72·6% in adults and 68·2% in children; Ascaris 44·7% in adults and 58·1% in children; *Enterobius vermicularis* 0·4% in adults and 2·4% in children; Strongyloides 24·3% in adults and 15·3% in children; Taenia 13·9% in adults and 18·2% in children; Trichuris 42·1% in adults and 50·9% in children. J.M.W.

29—Economic Proceedings of the Royal Dublin Society.

a. DUGGAN, J. J., 1958.—" Testing soil samples for beet root eelworm (*Heterodera schachtii* Schmidt)." **4** (4), 83–89.

(29a) By growing beet seedlings in glass tubes containing beet eelworm-infested soil, Duggan was able to show that an infection of one cyst per 200 c.c. soil could be detected by observing new cysts on the roots. The test was also found to be satisfactory in winter when the seedlings were given artificial heat and light. H.R.W.

30—Experimental Parasitology. New York.

a. SIMMONDS, R. A., 1958.—" Studies on the sheath of fourth stage larvae of the nematode parasite *Nippostrongylus muris*." **7** (1), 14–22.
b. HOFFMAN, G. L., 1958.—" Experimental studies on the cercaria and metacercaria of a strigeoid trematode, *Posthodiplostomum minimum*." **7** (1), 23–50.
c. BULLOCK, W. L., 1958.—" Histochemical studies on the Acanthocephala. III. Comparative histochemistry of alkaline glycerophosphatase." **7** (1), 51–68.
d. HANKES, L. V. & STONER, R. D., 1958.—" Incorporation of DL-tyrosine-2-C-14 and DL-tryptophan-2-C-14 by encysted *Trichinella spiralis* larvae." **7** (1), 92–98.
e. DAUGHERTY, J. W. & FOSTER, W. B., 1958.—" Comparative studies on amino acid absorption by cestodes." **7** (1), 99–107.
f. REINHARD, E. G., 1958.—" Landmarks of parasitology. II. Demonstration of the life cycle and pathogenicity of the spiral threadworm." **7** (1), 108–123.
g. ARCHER, D. M. & HOPKINS, C. A., 1958.—" Studies on cestode metabolism. III. Growth pattern of *Diphyllobothrium* sp. in a definitive host." **7** (2), 125–144.
h. STONER, R. D. & HANKES, L. V., 1958.—" *In vitro* metabolism of DL-tyrosine-2-C-14 and DL-tryptophan-2-C-14 by *Trichinella spiralis* larvae." **7** (2), 145–151.
i. GOODCHILD, C. G., 1958.—" Implantation of *Schistosomatium douthitti* into the eyes of rats." **7** (2), 152–164.
j. EVANS, A. S. & STIREWALT, M. A., 1958.—"Serologic reactions in *Schistosoma mansoni* infections. IV. Comparative ionographic study of sera of hamsters, mice, and albino rats." **7** (2), 165–177.
k. NYBERG, W., 1958.—" The uptake and distribution of Co^{60}-labelled vitamin B_{12} by the fish tapeworm, *Diphyllobothrium latum*." **7** (2), 178–190.
l. READ, C. P. & ROTHMAN, A. H., 1958.—" The carbohydrate requirement of *Moniliformis* (Acanthocephala)." **7** (2), 191–197.
m. READ, C. P., SCHILLER, E. L. & PHIFER, K., 1958.—" The role of carbohydrates in the biology of cestodes. V. Comparative studies on the effects of host dietary carbohydrate on *Hymenolepis* spp." **7** (2), 198–216.
n. READ, C. P. & ROTHMAN, A. H., 1958.—" The role of carbohydrates in the biology of cestodes. VI. The carbohydrates metabolized *in vitro* by some cyclophyllidean species." **7** (2), 217–223.
o. DISSANAIKE, G. A., JEFFERY, G. M. & BARTON, B. P., 1958.—" Radioactive tagging of hookworm larvae (*Necator americanus*) with P^{32}." **7** (2), 249–253.

(30a) Simmonds has demonstrated that the fourth-stage larval sheath of *Nippostrongylus muris* contains protein, carbohydrate and lipid. Heating in water caused the sheaths to contract to less than half their normal size; when subsequently cooled to room temperature they returned to about half the original size. When autoclaved at 120°C. for 12 hours they became irreversibly shrunken and misshapen but remained undissolved. The amino-acid composition resembled that of typical collagens except in the presence of a comparatively large amount of tyrosine. The effects of proteolytic enzymes and lyotropic agents indicated that the sheath substance is related to collagen but it differs in that it is unaffected by concentrations of acids which swell or solubilize collagens, whereas it is more susceptible to alkali. S.W.

(30b) From experimental studies of the life-cycle of *Posthodiplostomum minimum*, Hoffman concludes that there are two subspecies. He bases his differentiation mainly on the host specificity of the metacercariae and proposes that the minnow line should be called *P. m. minimum* and the centrarchid line *P. m. centrarchi* n.subsp. He lists the 97 species of fresh-water fish from which metacercariae of *P. minimum* have been recorded. An attempt was made to analyse the host specificity by exposure of fish to cercariae from naturally infected *Physa* and by transfaunation experiments. The development of the metacercarial cysts, the effect of the parasite on the fish, the excystment of the metacercariae and their ability to tolerate pepsin, trypsin, lowered *p*H, isotonicity and penicillin-streptomycin were studied. There is a comprehensive bibliography. S.W.

(30c) Bullock has made an extensive study of the distribution of alkaline glycerophosphatase in 23 species of Acanthocephala using a standardized form of the Gomori technique. Adults and, where possible, larvae and juveniles were examined. When present the distribution of alkaline glycerophosphatase activity was markedly similar throughout the group, the principal site being in the outer layer of the trunk subcuticula; the inner layer

of the subcuticula also contained considerable amounts of the enzyme but the middle layer and most other organs were negative, except in *Fessisentis vancleavei* where the proboscis and lemnisci showed a marked reaction. *Acanthocephalus* sp., *Leptorhynchoides thecatus* and all of eight species of the Neoechinorhynchidae examined were consistently negative. Detailed results are given and their significance is discussed. S.W.

(30d) Hankes & Stoner have studied the amino-acid metabolism of host and parasite in mice infected with *Trichinella spiralis*, using DL-tyrosine-2-C^{14} and DL-tryptophan-2-C^{14}. The C^{14}-labelled amino-acids were incorporated in the diet of uninfected controls and mice infected 56 and 180 days previously. In mice fed with the labelled tyrosine both 62-day-old and 186-day-old larvae incorporated significant amounts of C^{14} from the host tissues; the C^{14} content of the muscle protein from infected mice with the 62-day-old infection was higher than in the controls but in the second group the C^{14} activity was lower. In mice fed with the labelled tryptophan the 62-day-old and 186-day-old larvae incorporated 86% and 85% of their total C^{14} content into larval protein; in the muscle of the second group there was a tenfold increase in C^{14} activity, indicating that there may be a significant change in the tryptophan metabolism of the host during the course of a Trichinella infection. S.W.

(30e) Daugherty & Foster incubated *Hymenolepis diminuta* and *Raillietina cesticillus* in isotonic Tyrode's solution fortified with S^{35}-labelled L-methionine, S^{35}-labelled L-cystine or C^{14}-labelled L-methionine and studied their absorption. Both cestodes absorbed them actively but the rate for *R. cesticillus* was 400% to 600% higher than for *H. diminuta*. In *R. cesticillus* alanine, valine and glycine competed with methionine for the absorption mechanism, whereas glutamic and aspartic acids were either absorbed by a different mechanism or taken up by simple physical diffusion. The relationships in *H. diminuta* appeared to be similar in pattern but at a lower rate. The conditions for the absorption of cystine duplicated those for methionine and the absorption of cystine was inhibited by the presence of methionine. S.W.

(30f) Reinhard describes and quotes from the work of the many observers and investigators who have contributed to the discovery of *Trichinella spiralis*, of its pathogenicity to man and of its life-history, from the time of the observation of trichinae in a human cadaver by Paget in 1835 and in pork by Leidy in 1846, up to 1860 when Zenker gave the first account of a clinical case of trichinelliasis and, following Virchow's discovery and identification of the adults in the intestine of an experimental dog, observed the adults in the intestinal mucus from his previously reported case. S.W.

(30g) Archer & Hopkins found that the incidence of an unidentified species of *Diphyllobothrium* in *Coregonus clupeoides* in Loch Lomond was about 1·1 plerocercoids per fish. The plerocercoids were infective to herring-gulls, rats, cats and golden hamsters. Infectivity to rats increased with the weight of pleroceroid; of those below 5 mg. only 6·7% were infective. Early infections were established far back in the small intestine. After two days the worms moved forwards and the growth rate increased rapidly so that six days after infection the weight was about 20 times that of the infective pleroceroid. On the seventh day egg production started and growth decreased sharply. Histological examination showed that each stage of maturation occurred after a specific time in the gut of the definitive host. W.P.R.

(30h) Stoner & Hankes showed that *Trichinella spiralis* larvae incubated in serum-Krebs-Ringer containing either DL-tyrosine-2-C^{14} or DL-tryptophan-2-C^{14} took up C^{14} progressively through 3-hour to 48-hour periods of incubation. Of the C^{14} taken up from labelled tyrosine, 43% was incorporated into protein, and from labelled tryptophan, 35%. In serum-free medium 54% of the C^{14} from trytophan passed into protein. W.P.R.

(30i) Goodchild has demonstrated that *Schistosomatium douthitti* can be successfully transplanted from the veins of mice and hamsters into the anterior chamber of the eye in rats.

The schistosomes remained alive and active for as long as 161 days; when implanted young they attained sexual maturity and if implanted when mature the females continued to produce eggs for about 25 days and the males spermatozoa for about 50 days. After this time the reproductive organs lost progressively their integrity and function. The differences in growth rates between implanted worms and those in normal sites were studied. S.W.

(30j) Evans & Stirewalt have studied the serum protein response to progressive schistosomiasis mansoni in hamsters (highly susceptible) and rats (resistant) and compared these results with those they had previously recorded in mice [for abstract see Helm. Abs., **26,** No. 16b]. In infected hamsters the beta-2 and gamma globulins commenced to rise eight and 16 weeks after exposure respectively and continued to do so during the whole six months of the experiment. In infected rats neither the percentage composition nor the absolute concentration of the protein components differed significantly from those in the controls at any time. That the albumin component in all the rats was very small compared with that in other mammals and that the gamma globulin, even in young normal rats was considerably larger and better defined than in mice and hamsters are noteworthy. S.W.

(30k) Nyberg found that on the average about 44% of a single oral dose of Co^{60}-labelled vitamin B_{12} was taken up by *Diphyllobothrium latum*. *Taenia saginata* did not show radioactivity after the host had been given a single oral dose. Co^{60}-labelled cobalt chloride given orally to patients infected with *D. latum* or *T. saginata* was not absorbed by the parasites. W.P.R.

(30l) Read & Rothman found that the wet weight and polysaccharide content of *Moniliformis dubius* decreased when the rat host was fasted for 24 to 48 hours. Maltose fed to previously fasted rats did not produce changes in wet weight or polysaccharide content of worms removed two hours after feeding. Worms examined seven hours after feeding starch showed a marked increase in wet weight and polysaccharide content; if examined 25 hours after feeding, however, no changes were noted. When the rat host was placed on a diet free of carbohydrate for 12 days during the period of initial growth of the worm, the growth of *M. dubius* ceased. Growth was resumed when carbohydrate was included in the diet. W.P.R.

(30m) Read *et al.* found that the size and reproduction rate of *Hymenolepis diminuta* in rats was related to carbohydrate intake when it was fed as starch in quantities of 0·1 to 3·0 gm. per day. The quality and quantity of carbohydrate in the diet affected the size of segments and the number of eggs per segment. The addition of lactose to a diet in which starch was the sole source of carbohydrate inhibited growth. Fructose, however, improved the growth of worms when starch was present in the diet in sub-optimal amounts. *H. citelli* and *H. nana* resembled *H. diminuta* in their reactions to the quantity and quality of carbohydrate in the diet of the host. W.P.R.

(30n) Read & Rothman showed that anaerobic acid production by *Hymenolepis citelli* and *H. nana* was increased by glucose and galactose but not by fructose, mannose, maltose, trehalose, lactose or sucrose. *Cittotaenia* sp. used maltose and sucrose as well as glucose and galactose. Direct measurements showed that glucose, galactose and xylose decreased in the medium in which *Mesocestoides* was incubated. *Cittotaenia* sp. and *Taenia taeniaeformis* showed a "linear strobilar gradient" in the anaerobic production of acid. W.P.R.

(30o) Dissanaike *et al.* have demonstrated that it is possible to tag *Necator americanus* larvae with P^{32} by culturing the free-living stages in media containing the isotope. The degree of absorption by the larvae was influenced by the medium used, the strength of P^{32} and by the addition of bacteria which had been immersed previously in 250 μc. per c.c. of P^{32}; greatest absorption occurred in an isotonic saline medium with the added bacteria. Even in culture with 90 μc per c.c. of P^{32} there was no retardation of growth. S.W.

31—Illinois Veterinarian.

a. LEVINE, N. D., KANTOR, S. & TAYLOR, G. D., 1958.—" Trials of organic phosphorus nematocides in sheep and mice." **1** (1), 6–9.

(31a) The following four organic phosphorus compounds, which had been found to have anthelmintic value against larval strongyles of the horse *in vitro*, were tested on sheep with gastro-intestinal nematodes: (i) o(2,2-dichlorovinyl)-o,o-dimethyl phosphate had no effect at 25 mg. per kg. body-weight and only slight effect at 50 mg. per kg., (ii) o,o-diethyl 4-oxopenten-1-yl phosphonate had no effect at 10 mg. per kg. but killed two sheep given 25 mg. per kg. and 40 mg. per kg., (iii) o,o,o-tri-*n*-propyl phosphorotrithioite killed a sheep given 400 mg. per kg. but had no apparent effect on the nematodes and (iv) o,o dimethyl 2,2,2-trichloro-1-hydroxyethylphosphonate eliminated almost all the nematodes from one sheep given 400 mg. per kg. R.T.L.

32—Indian Journal of Helminthology.

†a. THAPAR, G. S., 1958.—" On the morphology and systematic position of a new genus of trematodes from the intestine of the yellow bat, *Nycticejus kuhlii*." **8** (2), 85–91.
†b. CHATTERJI, P. N., 1958.—" On a new avian trematode of the genus *Brachylaemus* (Dujardin, 1843) Blanchard, 1847." **8** (2), 92–95.
†c. CHATTERJI, P. N., 1958.—" On a new species of the genus *Psilostomum* Looss, 1899." **8** (2), 96–99.
†d. GUPTA, S. P., 1958.—" Two new trematodes of the family Allocreadiidae from the fresh-water fishes of U.P." **8** (2), 100–106.
†e. SINGH, K. P., 1958.—" *Choanotaenia aurantia* n.sp. (Dilepididae: Cestoda) from a tern, *Sterna aurantia* Gray, from India." **8** (2), 107–111.
†f. GUPTA, S. P., 1958.—" A redescription of *Bucephalopsis magnum* (Verma 1936) Srivastava 1938 and *Bucephalopsis karvei* Bhalerao, 1937." **8** (2), 112–121.
†g. SINGH, K. S., 1958.—" Distribution of glycogen and other polysaccharides in *Diplodiscus temperatus* Stafford (Trematoda: Paramphistomatidae)." **8** (2), 122–126.

(32a) A trematode reported by Thapar in *Proc. Indian Sci. Congr.*, (18th) 1931, p. 220 was found again in the bat *Nycticejus kuhli* at Lucknow and is named *Exorchocoelium indicum* n.g., n.sp. It resembles *Platynosomum* but differs in the character of the excretory bladder which in the new species is a short wide tube and in the absence of body spines. From *Paradistomum* it is distinguished by the circular shape of the cirrus sac and the position of the gonopore in the mid-line between the acetabulum and caecal bifurcation. Thapar points out that his specimens cannot belong to *Anchitrema* as suggested by Pande in 1935 because they have a cirrus sac and receptaculum seminis but no body spines. M.McK.

(32b) *Brachylaemus tisa* n.sp. from a kite *Butastur tisa* from Orissa, India, differs from *B. fulvus* and *B. arcuatum* in the combination of the following characters: the absence of cuticular spines and of serration on the intestinal and body walls, the separation of the gonads, the well developed uterine coils and the very long protrusible cirrus. It is differentiated from *B. helicis* and *Brachylaemus* sp. of Sandground (1938) by the subequal size of the suckers, the extent of the vitellaria in front of the acetabulum, the position of the gonopore in front of the anterior testis and the long protrusible cirrus. M.McK.

(32c) *Psilostomum chilkai* n.sp. is described and figured from a fish *Lates calcarifer* collected in Chilka Lake, Orissa, India. It can be differentiated from the known species of *Psilostomum* by the extension of the vitellaria anteriorly to the level of the pharynx, the position of the cirrus sac well in front of the acetabulum and the presence of only a few eggs which are large and well developed. M.McK.

(32d) Gupta reports two new species of *Allocreadium* from fresh-water fishes from the fish market at Lucknow. In *A. kamalai* n.sp. from *Chela bacaila* the vitellaria extend forwards to the posterior margin of the oral sucker, a prepharynx is present, the cirrus pouch is anterior

†Although this part is dated September 1956 it was not issued until February 1958.

to the acetabulum and the gonopore lies in front of the ventral sucker and on the mid-line, 0·5 mm. from the anterior end. In *A. mehrai* n.sp. from *Rhynchobdella aculeata* the vitellaria are situated between the level of the ovary and the posterior end of the body, the posterior testis is 0·21 mm. behind the anterior testis, which lies 1·44 mm. from the front end, the oesophagus measures 0·05 mm.×0·07 mm. and the gonopore is on the mid-line, anterior and close to the acetabulum. M.McK.

(32e) *Choanotaenia aurantia* n.sp., found in a tern *Sterna aurantia* in India, is distinguished from the nearly related species *C. cayennensis*, *C. chandleri*, *C. macracantha*, *C. lobipluviae*, *C. magnihamata*, *C. bhattacharai*, *C. barbara* and *C. magnicirrosa* by a combination of characters which include the size of strobila, 10 mm.–37 mm.×0·315 mm.–0·487 mm., the single row of 14 to 18 delicate rostellar hooks measuring 0·014 mm.–0·019 mm., the number (16 to 20) of testes and the size of cirrus sac which is 0·112 mm.–0·196 mm.×0·018 mm. 0·028 mm. M.McK.

(32f) *Bucephalopsis magnum* from the fish *Silundia gangetica* from the River Gomti, Lucknow, India is redescribed and the measurements now observed are tabulated with those recorded by Verma in 1936 and Srivastava in 1938. Flukes recovered from the fishes *Belone cancila* from the Gomti river were intermediate between *B. karvei* and *B. belonea* in the relative positions of some of the organs and in measurements, which are tabulated for the three species. Gupta identifies his flukes as *B. karvei* of which *B. belonea* is a synonym, and gives a key to the eight species of *Bucephalopsis* from India. M.McK.

(32g) Glycogen and other polysaccharides have been reported to be absent from the intestinal cells of trematodes but were found in the caecal cells, sperms and vitellaria of *Diplodiscus temperatus*. Polysaccharides were abundant in the muscle sheaths and in the membrane around the ovary and were present in the tissue surrounding the ova. The parenchyma contained glycogen in quantity. The cuticle was free of glycogen but rich in other polysaccharides. M.McK.

33—Indian Journal of Medical Research.

a. GANATRA, R. D., SHETH, U. K. & LEWIS, R. A., 1958.—" Diethylcarbamazine (hetrazan) in tropical eosinophilia." **46** (2), 205–222.

(33a) 94 consecutive patients suffering from tropical eosinophilia and showing a uniform clinical pattern were treated with diethylcarbamazine (hetrazan) in dosages of 13 mg. per kg. body-weight daily for four days, 13 mg. per kg. daily for eight days, 6 mg. per kg. daily for four days, 6 mg. per kg. daily for eight days, 3 mg. per kg. daily for eight days and 26 mg. per kg. daily for one day. The results were compared with two control groups—one of 30 patients kept without specific treatment and one of 27 patients treated with 0·26 gm. of carbasone twice daily for ten days. Despite temporary aggravation of symptoms early in treatment all dosage schedules were effective in lowering the eosinophil count and in producing symptomatic cure; but 13 mg. per kg. for eight days, 6 mg. per kg. for eight days and 26 mg. per kg. for one day produced a better fall in the eosinophil count during the critical period. Rate of treatment-failure in the carbasone group and the various hetrazan groups was not significantly different. Results of treatment in the hetrazan groups compared favourably with the first control group. Hetrazan has therapeutic response in tropical eosinophilia at least equal to that of organic arsenicals. J.M.W.

34—Indian Veterinary Journal.

a. ALWAR, V. S., LALITHA, C. M. & SENEVIRATNA, P., 1958.—" *Vogeloides ramanujacharii* n.sp., a new lungworm from the domestic cat (*Felis catus* Linne), in India." **35** (1), 1–5.
b. CHITWOOD, B. G., 1958.—" Nematology in relation to veterinary and human medicine." **35** (1), 12–18.
c. ALWAR, V. S., 1958.—" Parasites of pigs (*Sus scrofa domestica*) in Madras." **35** (3), 112–116.

d. PANNU, H. S., 1958.—" 'Hump sore' in Kutch." **35** (4), 172–173.
e. ANANTARAMAN, M., 1958.—" Fluke diseases and their control." **35** (4), 182–184.
f. PUROHIT, M. S. & LODHA, K. R., 1958.—" Haemonchosis in a camel." **35** (5), 219–221.
g. VICTOR, D. A., 1958.—" Cerebrospinal nematodiasis. II. Transplantation of *S. digitata* into experimental hosts." **35** (5), 224–226.

(34a) *Vogeloides ramanujacharii* n.sp. occurred in the lungs of 12 out of 50 cats examined in Madras. Two of the infected animals were kittens four to six months old. There are no cervical papillae. The excretory pore is in the anterior part of the oesophagus. The vagina is short. The male has only two pre-anal and two post-anal papillae. The spicules are 146 μ–180 μ long, the gubernaculum is 20 μ to 30 μ long. The female is slender and measures 13·4 mm. to 30·6 mm. in length. The vagina is 981 μ–2,200 μ long. The tail is 78 μ to 105 μ in length and the distance from vulva to tail tip is 158 μ to 225 μ. The eggs measure 40 μ–45 $\mu \times$ 25 μ–32 μ. The various measurements of the six other species are tabulated with those of the new species. The nematodes previously recorded in the lungs of cats are *Aelurostrongylus abstrusus*, *Vogeloides massinoi* and *Anafilaroides rostratus*. R.T.L.

(34c) Alwar lists and annotates the 17 species of helminths recovered by him from 50 adult pigs and 15 piglets slaughtered in the city of Madras. *Enterobius vermicularis*, *Streptopharagus* sp. and *Onchocerca* sp. are new records for the pig and *Simondsia paradoxa* is recorded for the first time outside Europe. R.T.L.

(34d) Hump sore due to *Stephanofilaria assamensis*, which affects all breeds of cattle all over the district of Kutch on the western coast of India, was treated by either (i) surgical removal of the affected skin and cautery of the surrounding and deeper tissues or (ii) application of antimony tartrate ointment (1:6); this caused sloughing and after three applications the lesion was treated as an ordinary wound and healed in a fortnight. (iii) In a few cases two intravenous injections of 20 c.c. of 1% aqueous solution of antimony tartrate at an interval of 10 days, with antimony tartrate dressings at four-day intervals effected a complete cure. R.T.L.

(34f) Although *Haemonchus longistipes* was recorded for the first time as an infection in camels by Railliet & Henry in 1909 this is the first record of the occurrence of haemonchosis in this host. At an autopsy in Bikaner the abomasum of a camel calf was found to be packed with these helminths. There were a few *Trichuris globulosa* in the large intestine. R.T.L.

(34g) Adult *Setaria digitata* obtained from bovines were transplanted into the peritoneal cavity of a rabbit and of one male and one female goat, both 11 months old. None of the animals showed any microfilariae in the blood examined subsequently over a long period and none of the adult worms were recovered at autopsy. R.T.L.

35—Journal of the American Veterinary Medical Association.

a. TURK, R. D., 1958.—" Anthelmintics for poultry." **132** (1), 13–15.
b. JASKOSKI, B. J. & WILLIAMSON, W. M., 1958.—" A fatal nematodiasis in the camel." **132** (1), 35–36.
c. LINDQUIST, W. D., 1958.—" Some effects of hygromycin on early natural infections of *Ascaris lumbricoides* in swine." **132** (2), 72–75.
d. MANSFIELD, M. E., 1958.—" A survey of gastrointestinal nematodes in feeder calves in southern Illinois." **132** (3), 99–100.
e. BREWER, N. R., 1958.—" The use of sustained-action quinacrine tablets in the treatment of dogs infected with common tapeworms." **132** (8), 340–342.

(35a) From a review of recent literature, Turk concludes that the control of the numerous helminth infections in poultry in the U.S.A. is primarily one of prevention by management for, although they may cause serious losses, these infections are rarely diagnosed during life. Satisfactory results against *Syngamus trachea* are, however, obtainable by barium antimonyl tartrate given as an inhalant. Phenothiazine is effective and safe for the treatment of *Heterakis gallinae*. Carbon tetrachloride, nicotine sulphate, nicotine combined with bentonite, and

phenothiazine and piperazine compounds, have been recommended for the removal of *Ascaridia galli*. None is effective against larval stages in the tissues. Trematodes are seldom eliminated by anthelmintics although 1 ml. to 3 ml. of carbon tetrachloride has been suggested. Cestodes may be present in large numbers without causing serious damage: di-*n*-butyl tin dilaurate has been found effective when added to the feed but flock treatment is not economically feasible. R.T.L.

(35b) A six-year-old *Camelus bactrianus* suffering from emaciation, weakness and diarrhoea died from pneumonia at the Chicago Zoological Park. Numbers of *Camelostrongylus mentulatus*, *Trichostrongylus colubriformis* and many *Trichuris globulosa* were collected at autopsy. Peculiar cyst-like balls of faecal matter in the caecum each contained from four to six *Trichuris* enclosed in typical connective tissue with extensive leucocytic invasions. R.T.L.

(35c) The addition of hygromycin B to the feed of pigs although reported to be effective against adult *Ascaris lumbricoides* did not inhibit the migratory phase. R.T.L.

(35d) The number of gastro-intestinal nematode eggs per gramme (excluding those of *Strongyloides* and *Nematodirus*) found in the faeces of 362 feeder calves from 131 farms in southern Illinois is tabulated. *Nematodirus* ova were found only in 22 of the calves. *Moniezia* eggs were present in calves from 31 farms. R.T.L.

(35e) Quinacrine in a "sustained action" form was used in the treatment of 23 dogs naturally infected with *Dipylidium caninum* or *Taenia pisiformis*, or both. In all but six animals that were killed and autopsied 2 to 60 days after treatment, assessment of curative effect was based on the presence or absence of proglottides in the faeces. Follow-up examinations were carried out up to 14 days from treatment in most instances and to 60 days in five instances. The drug was given as a single oral dose of 20·0–45·0 mg. per kg. body-weight. Most of the tapeworms were expelled during the first 24 hours after treatment. In seven dogs treated, evidence from follow-up and autopsy indicated that the single dose was fully effective; in the remaining dogs the evidence for full effectiveness was encouraging but not, in the author's opinion, conclusive. Side effects were almost entirely absent, only one dog showing nausea. O.D.S.

36—Journal of the Australian Institute of Agricultural Science.

a. MEAGHER, J. W., 1958.—" Nematodes as plant parasites." **24** (1), 3–12.

(36a) This is a general account of plant-parasitic nematodes in Australia. Nematode genera mentioned are *Ditylenchus*, *Aphelenchoides*, *Anguina*, *Meloidogyne*, *Heterodera*, *Tylenchulus*, *Pratylenchus*, *Radopholus*, *Hoplolaimus*, *Xiphinema*, *Tylenchorhynchus*, *Belonolaimus*, *Trichodorus*, *Paratylenchus*, *Dolichodorus*, *Criconema*, *Criconemoides*, *Rotylenchus* and *Helicotylenchus*. The role of nematodes in disease complexes is discussed and methods of control—cultural, chemical and biological—are mentioned. R.D.W.

37—Journal of Comparative Pathology and Therapeutics.

a. SOULSBY, E. J. L., 1958.—" Studies on the heterophile antibodies associated with helminth infections. I. Heterophile antibody in *Ascaris lumbricoides* infection in rabbits." **68** (1), 71–81.

(37a) Soulsby has confirmed the presence of the Forssman antigen in *Ascaris lumbricoides* and has demonstrated the presence of homologous antibody in rabbits infected with this nematode. The antibody appeared to be closely related to the classical Forssman type; it may be distinguished from other heterophile types by the absence of marked agglutination of sheep cells. Although it gave no protection against infection the antibody served as a useful tool in delineating the various aspects of the antibody response as it was easily detected. The

second ecdysis of Ascaris larvae appeared to be the earliest period at which there was a marked release of antigens. The homologous antigen was present in the tissues, mainly intestine, of adult Ascaris, in an extract of larvae and in the larval secretions and excretions. S.W.

38—Journal of Histochemistry and Cytochemistry.

a. PEPLER, W. J., 1958.—" Histochemical demonstration of an acetylcholinesterase in the ova of *Schistosoma mansoni*." **6** (2), 139–141.

(38a) Pepler found that acetylcholinesterase could be detected by histochemical methods in miracidia in the eggs of *Schistosoma mansoni*. The enzyme was found only in a small central area of nervous tissue in the miracidium. W.P.R.

39—Journal of Parasitology.

a. OTTO, G. F., 1958.—" Some reflections on the ecology of parasitism." **44** (1), 1–27.
b. HUFF, C. G., NOLF, L. O., PORTER, R. J., READ, C. P., RICHARDS, A. G., RIKER, A. J. & STAUBER, L. A., 1958.—" An approach toward a course in the principles of parasitism." **44** (1), 28–45.
c. SAWYER, T. K., 1958.—" *Metagonimoides oregonensis* Price, 1931 from a Georgia raccoon with a note on *Sellacotyle mustelae* Wallace, 1935." **44** (1), 63.
d. GUILFORD, H. G., 1958.—" Observations on the development of the miracidium and the germ cell cycle in *Heronimus chelydrae* MacCallum (Trematoda)." **44** (1), 64–74.
e. HEDRICK, R. M., 1958.—" Comparative histochemical studies on cestodes. II. The distribution of fat substances in *Hymenolepis diminuta* and *Raillietina cesticillus*." **44** (1), 75–84.

(39a) Under the headings amoebiasis, Leucocytozoon, filariasis, hookworm, echinococcosis and trichinosis, Otto brings together a variety of data and reflections on the ecology of parasitism. He illustrates by reference to the periodicity and age distribution of Wuchereria infections how differences in the ecology of the worm, man and vector combine to produce basic differences in the epidemiology of the disease. It is suggested that the use of gamma rays to control trichinosis in pork would be unsuitable in the cases of home-butchered pigs or those killed in small abattoirs, whence most of the infections in man have come. In the concluding statement he claims that the gaps in our knowledge of parasitology are greater in ecology than in any other field and that even available information has not been fully utilized. M.McK.

(39c) *Metagonimoides oregonensis* is reported for the second time in *Procyon lotor*. Other helminths collected from the same animal were *Oochoristica procyonis*, *Molineus barbatus*, *Physaloptera rara*, *Fibricola texensis*, *Pharyngostomoides procyonis*, *Eurytrema procyonis* and *Sellacotyle mustelae*. R.T.L.

(39d) In *Heronimus chelydrae* the life-cycle is abbreviated. Cleavage of the fertilized ovum results in a two-cell stage consisting of an ectodermal cell giving rise to most somatic tissues, and a propagatory cell from which some somatic tissue and one generation of germinal cells are derived. No meiotic divisions or fertilization stages were observed in the germinal cells, each of which develops directly into a cercarial embryo in which a genital primordium is segregated early in development. R.T.L.

(39e) In *Hymenolepis diminuta* and *Raillietina cesticillus* lipid material was found chiefly in the parenchymal region while the organ systems were relatively free of it. This distribution is in general agreement with that hitherto observed in cestodes. Neutral fats gradually increased from immature to gravid regions but while *H. diminuta* contained most of the lipid material in the medullary parenchyma *R. cesticillus* showed a ring of fat concentration peripheral to the parenchymal muscles. In both species phospholipids were chiefly concentrated in the subcuticular cells. This subcuticular concentration was greater in *R. cesticillus*, which had further concentrations of phospholipids in the medullary region adjacent to the egg-bearing pouches. M.McK.

39—Journal of Parasitology (cont.)

f. VILLELLA, J. B., GOULD, S. E. & GOMBERG, H. J., 1958.—" Effect of cobalt-60 and X-ray on infectivity of *Ascaris* eggs." **44** (1), 85–92.
g. LEIGH, W. H., 1958.—" *Carneophallus turgidus* sp.nov. (Trematoda: Microphallidae) from the raccoon, *Procyon lotor*, in South Florida." **44** (1), 100–102.
h. GOODMAN, J. D., 1958.—" Travtrematinae nom.nov. for Leptophyllinae Byrd, Parker and Reiber, 1940 (Plagiorchiidae: Trematoda)." **44** (1), 106–108, 109.
i. STAUBER, L. A., 1958.—" Swimmer's itch in New Jersey." **44** (1), 108.
j. DERY, D. W., 1958.—" A revision of the genus *Gynaecotyla* (Microphallidae: Trematoda) with a description of *Gynaecotyla riggini* n.sp." **44** (1), 110–112.
k. TURNER, F. B., 1958.—" Some parasites of the western spotted frog, *Rana p. pretiosa*, in Yellowstone Park, Wyoming." **44** (2), 182.

(39f) Villella *et al.* investigated the possibility of controlling Ascaris infection by means of ionizing radiations. Using *Ascaris lumbricoides* of the pig, they found that (i) in unsegmented eggs exposed to 100,000 rep Co^{60}, only 1% of embryos developed even after 21 days incubation (at 30°C.); (ii) a dose of 100,000 to 150,000 rep Co^{60}, or X-radiation in a dose of 100,000 r, applied to infective eggs prevented larval infection in the lungs of guinea-pigs, but that mild focal pneumonitis followed even when the eggs used had been irradiated with 250,000 and 500,000 rep; (iii) eggs in the infective stage were more sensitive than unsegmented eggs to Co^{60} in doses of 30,000 to 100,000 rep (as judged by the number of larvae recovered from the lungs of infected guinea-pigs). Decorticated eggs were used in all experiments, hence in practice higher dosages would be required to allow for penetration of the albuminoid layer as well as the thickness of the contaminated material. It was confirmed that the guinea-pig is much more susceptible than the white rat to pulmonary larval infection with Ascaris. J.M.W.

(39g) In *Carneophallus turgidus* n.sp. from *Procyon lotor* in Florida there are three lobes on the male papilla as in *C. trilobatus* but in the new species the ventral lobe is pyriform and its axis is at right angles to the other two lobes, which are generally linguiform. The lobation is more marked than in *C. muellhaupti*. No prepharynx was observed. A seminal receptacle was seen in live specimens under pressure. M.McK.

(39h) As *Leptophyllum* Cohn, 1902, the type genus of Leptophyllinae Byrd, Parker & Reiber, 1940, is a homonym of the myriapod genus *Leptophyllum* Verhoeff, 1895, Goodman re-establishes *Travtrema* Pereira, 1929 and replaces Leptophyllinae by Travtrematinae nom.nov. *Leptophyllum stenocotyle* therefore becomes *Travtrema stenocotyle* n.comb. and although *L. tamiamiensis* and *L. ovalis* are probably synonyms of *L. stenocotyle*, they are now transferred to *Travtrema* as new combinations. M.McK.

(39i) The first human cases of naturally acquired cercarial dermatitis are reported from New Jersey. *Physa heterostropha* from a pond where swimmers were subject to dermatitis yielded specimens of *Cercaria physellae* which produced maculae on one person soon after exposure. On tidal flats, where paddlers had acquired dermatitis, *Nassarius obsoletus* was found infected with cercariae of *Microbilharzia variglandis* which are known to cause dermatitis. M.McK.

(39j) *Gynaecotyla riggini* n.sp., from *Arenaria interpres morinella* from Florida, differs from the other species of the genus in that the genital pore is on the left, the ovary is on the right and the vitellaria are anterior to the testes. *Gynaecotyla* is revised to include the new species and a key is given to the four species in the genus. *G. jägerskioldi* is made a synonym of *G. adunca*. M.McK.

(39k) Turner examined a number of *Rana p. pretiosa* from different populations in the Yellowstone National Park and found the following helminths: *Spironoura pretiosa*, *Haematoloechus* sp., *H. similiplexus*, *Glypthelmins* sp., *Gorgoderina tanneri* and *Halipegus* sp. S.W.

39—Journal of Parasitology (cont.)

l. REID, W. M. & CARMON, J. L., 1958.—" Effects of numbers of *Ascaridia galli* in depressing weight gains in chicks." **44** (2), 183–186.
m. BECKLUND, W. W., 1958.—" *Cooperia spatulata* recovered from cattle in the United States." **44** (2), 186.
n. SCOTT, J. A. & MACDONALD, E. M., 1958.—" Immunity to challenging infections of *Litomosoides carinii* produced by transfer of developing worms." **44** (2), 187–191.
o. HARGIS, Jr., W. J., 1958.—" Coelacanths and monogeneids." **44** (2), 191.
p. TROMBA, F. G., CHITWOOD, M. B. & YUNKER, C. E., 1958.—" The occurrence of eggs in male physalopterids and observations on the morphology of *Abbreviata sonsinoi* (v. Linstow, 1895) Shul'ts, 1927." **44** (2), 192–195, 196.
q. SMITH, R. J., 1958.—" The miracidium of *Wardius zibethicus* (Trematoda: Paramphistomatidae)." **44** (2), 195.

(39l) Reid & Carmon exposed each of 338 three-week-old chicks to 300 infective ova of *Ascaridia galli* and studied the effect on their weight gains compared with those in 338 uninfected controls. The results they obtained do not substantiate the work of Todd & Hansen who concluded that birds exposed to a uniform parasitic infection weighed less if they had fewer worms than if they had many [for abstract see Helm. Abs. **20,** No. 5a]. Chicks with few or no nematodes gained significantly more weight than did those with large numbers. S.W.

(39m) Becklund reports that, during a survey of the helminth parasites of cattle in southern Georgia, he found two animals infected with *Cooperia spatulata*. This appears to be the first record of this species in the U.S.A. S.W.

(39n) Scott & Macdonald introduced late third-stage larvae of *Litomosoides carinii* into the abdominal cavity of cotton-rats, which had not been previously exposed to infection, on three successive occasions at intervals of about seven days. Infective larvae were used in the same way in a parallel series. 33 to 41 days later the cotton-rats of both series and the uninfected controls were challenged by introducing a known number of infective larvae subcutaneously. The worms which developed from the challenging infection were retarded in growth and development in both series of experimental cotton-rats as compared with the controls, but somewhat less so in those which had received the third-stage larvae than in those which had received infective larvae. S.W.

(39o) Careful examination of the gill-arches of the coelacanth *Latimeria chalumnae* (specimen C^6) revealed larval isopods (*Praniza milloti* Monod, 1954) but no monogenetic trematodes. Thus far three out of four coelacanths investigated have yielded no gill parasites. Discovery of further uninfected coelacanths may indicate that monogeneids are relatively recently acquired parasites of fish. J.M.W.

(39p) Tromba *et al.* observed eggs in functional males of *Physaloptera* sp. from *Citellus leucurus* in Utah, *Skrjabinoptera phrynosoma* from *Leiocephalus carinatus punctatus* in the Bahamas and *Abbreviata sonsinoi* from *Agama mutabilis* in Egypt. The eggs were located most commonly in the posterior third of the intestine and less frequently in the rectal glands, vas deferens or cloaca. The possibility that they had been ingested appears to be precluded and it seems probable, in view of the exceptionally large anal opening and certain other anatomical details found in physalopterids, that they had been introduced into the males during copulation. Examination of the denticulation in *en face* preparations of the heads of the specimens of *Abbreviata sonsinoi* confirmed that this species does, in fact, belong in *Abbreviata*. S.W.

(39q) Smith describes the development of the miracidium of *Wardius zibethicus*. Hatching usually occurred during the latter part of the seventh week and appeared to be brought about by the forceful movements of the miracidium. The dermal cells number 6:8:4:2; the apical gland occupies almost one quarter of the body; there is a large mass of

39—Journal of Parasitology (cont.)

r. LUND, E. E. & BURTNER, Jr., R. H., 1958.—" Effect of four embryonation media on the embryonation and infectivity to chickens of *Histomonas*-bearing eggs of *Heterakis*." **44** (2), 197–200.
s. TROMBA, F. G. & DOUVRES, F. W., 1958.—" Cross transmission of nematodes of domestic animals. III. Preliminary observations on the infection of goats and rabbits with *Hyostrongylus rubidus*." **44** (2), 209.
t. SINGH, K. S., 1958.—" A redescription and life-history of *Gigantocotyle explanatum* (Creplin, 1847) Nasmark, 1937 (Trematoda: Paramphistomidae) from India." **44** (2), 210–221, 222–224.
u. SHUMARD, R. F. & BOLIN, F. M., 1958.—" An instance of erratic parasitism in the skunk, *Mephitis mephitis*." **44** (2), 221.
v. STUNKARD, H. W., 1958.—" The morphology and life-history of *Levinseniella minuta* (Trematoda: Microphallidae)." **44** (2), 225–229, 230.

nervous tissue at the anterior end with small nerve fibres extending to lateral sensory papillae. The excretory system is similar to that in other paramphistome miracidia. The posterior two-thirds of the body is filled with germinal masses. Penetration experiments were unsuccessful. S.W.

(39r) Lund & Burtner maintained eggs of *Heterakis* in physiological saline, 1·5% nitric acid, 1·0% formalin or 2·0% potassium dichromate. All permitted satisfactory embryonation but the number of worms recovered from chicks fed the eggs from the dichromate solution was less than 1% of the number of eggs administered and the incidence of *Histomonas* was less than one-tenth of the incidence in chicks fed eggs from the three other media. The percentage of eggs which embryonated was highest (31·0%) in 1·0% formalin. Worm recovery and the incidence of *Histomonas* were comparable from the formalin, saline and nitric acid media. S.W.

(39s) Tromba & Douvres have successfully infected an eight-week-old kid and an eight-month-old rabbit with *Hyostrongylus rubidus*. 13,000 infective larvae were given to the kid and 78,000 to the rabbit; at autopsy about 2,240 sexually mature adults were recovered from the kid and about 11,200 from the rabbit, which also contained about 43,280 larvae. S.W.

(39t) Singh redescribes *Gigantocotyle explanatum* from buffalo in India and considers *G. bathycotyle* to be synonymous. He has completed the life-cycle experimentally and describes and illustrates the development of the egg, miracidium, sporocyst, redia and cercaria. No daughter sporocysts or daughter rediae were observed. Large numbers of snails of various species and all ages were exposed to infection. *Gyraulus convexiusculus* showed the highest infection rate and *Indoplanorbis exustus* was refractory. He compares his observations with those recorded by other workers. S.W.

(39u) Shumard & Bolin report finding two adult females of a species of *Physaloptera*, probably *P. maxillaris*, in the brain of *Mephitis mephitis*, one in the otic capsule, the other in the cavity overlying the cortical region. Encapsulated larvae were present in the hippocampus region. S.W.

(39v) Stunkard describes the life-cycle of *Levinseniella minuta*, the second to be completed experimentally in this genus. The encysted metacercariae were found in extremely large numbers in *Hydrobia minuta*, and subsequently also in *Amnicola limosa*; when the infection was present it was always very intense, indicating that the cercariae encysted in the snails in which they were produced and that a second intermediate host was omitted. Metacercariae were fed to mice and sexually mature adults recovered from the intestine 48 and 72 hours later but the infection was lost by the eighth day. Eggs from these adults were fed to 12 *Hydrobia minuta*, all of which became infected and in which encysted metacercariae were produced. No cercariae were observed to be shed. The cercariae emerged from the sporocysts tail-less and relatively immature, this being correlated with the abbreviation of the life-history. Two generations of sporocysts were produced. The morphology of the adults and larvae is described and figured. S.W.

39—Journal of Parasitology (cont.)

w. HOFFMAN, G. L., 1958.—" Experimental infection with strigeoid cercariae." **44** (2), 229.
x. EVANS, H. E. & MACKIEWICZ, J. S., 1958.—" The incidence and location of metacercarial cysts (Trematoda: Strigeida) on 35 species of central New York fishes." **44** (2), 231–235.
y. SRIVASTAVA, O. N., 1958.—" *Proechinocephalus tarai* n.gen., n.sp., a new trematode (Echinostomatidae) from an Indian egret, *Bulbulcus* [*Bubulcus*] *ibis coromandus*." **44** (2), 236–238.
z. McCAULEY, J. E., 1958.—" A new method for examining snails for trematode parasites." **44** (2), 243–244.
ba. WEBER, T. B., 1958.—" Immunity in cattle to the lungworm, *Dictyocaulus viviparus*: a test of the persistence of acquired resistance." **44** (2), 244–245.
bb. CHAN, K. F. & KOPILOF, S., 1958.—" The distribution of *Syphacia obvelata* in the intestine of mice during their migratory period." **44** (2), 245–246.

(39w) Hoffman reports on experimental exposures of frog tadpoles and a variety of fish to eight different strigeoid cercarial forms. Metacercariae were recovered from sunfish and large-mouthed black bass, *Huro salmoides*, which had been exposed to *Cercaria psi* (Brookes, 1948) and diplostomulae from body-cavities of frog tadpoles exposed to *Cercaria kappa*. No attempt was made further to elucidate the life-cycles of these worms. P.K.

(39x) In this survey Evans & Mackiewicz examined a total of 3,881 fish, representing seven families and 35 species, for strigeid metacercariae; the work was carried out from November 1949 to January 1950. There appeared to be no fluctuation in cyst counts from month to month. The Cyprinidae were the most heavily parasitized, the Catostomidae, Percidae and Centrarchidae less so and the Ameiuridae, Esocidae and Cottidae had only small numbers of encysted metacercariae. The greatest numbers of cysts were found on the body proper; the caudal fin had more cysts than any of the other fins. The results are tabulated under host species and the host-parasite relationships are discussed briefly. The possibility of hybridization increasing susceptibility is mentioned. S.W.

(39y) Srivastava describes and illustrates *Proechinocephalus tarai* n.g., n.sp. from the small intestine of *Bubulcus ibis coromandus* in Allahabad. The new genus is placed in the Echinostomatidae and appears to be most closely related to *Chaunocephalus* but may be differentiated from it by the shape of the body, which is elongate and not divided into a swollen anterior and elongated posterior part, by the more anterior position of the acetabulum, by the absence of vitellaria in front of the acetabulum, by the smaller number of collar spines and by the greater width of the gut caeca. S.W.

(39z) McCauley describes a new method of examining the hepatopancreas of living snails for developing trematode larvae. The method involves grinding through the tip of the shell and the extrusion of the hepatopancreas through the aperture. A low mortality is claimed among snails which have been so treated. P.K.

(39ba) Two animals (30 months old) which had been protected, as calves, from a lethal dose of 50,000 *Dictyocaulus viviparus* larvae by the intravenous injection of 5·0 ml. per lb. body-weight of immune serum were still resistant to infection after two years. Comparison with the infections obtained in two previously unexposed animals showed that some age resistance may have occurred and there is some doubt as to whether the strong resistance was entirely due to the prior infection. It is evident however that attainment of the age of 30 months does not preclude high susceptibility to infection. K.H.

(39bb) 34 nematode-free male mice were experimentally infected with *Syphacia obvelata* by association with heavily parasitized "source" mice. These mice were then sacrificed in groups of three to eight at 24-hour intervals for six days beginning 10 days after infection. The maximum number of migrating gravid worms found in the colon (36%) was during the 24-hour period beginning 12 days after infection. The remaining 64% were in the caecum. Perianal swabs were positive for *S. obvelata* eggs as early as 11 days after infection. Eggs of migrating worms became infective after 20 hours incubation at room temperature or three to five hours at blood-heat. J.M.W.

39—Journal of Parasitology (cont.)

bc. CAUTHEN, G. E., 1958.—" Inefficacy of rabbits for testing anthelmintics to be used against gastro-intestinal nematodes of ruminants." **44** (2), 246.

bd. ROWAN, W. B., 1958.—" Mass cultivation of *Australorbis glabratus*, intermediate host of *Schistosoma mansoni* in Puerto Rico." **44** (2), 247.

(39bc) Rabbits which had been heavily infected experimentally with *Trichostrongylus axei* were treated six to nine weeks later in separate groups by heavy dosage of phenothiazine, anhydrous piperazine and cunic. Although the two first-named drugs have been shown to be effective against *T. axei* in calves, and the last-named has long been recognized as a valuable anthelmintic in sheep and cattle, particularly against *Haemonchus*, the results in every case were erratic and of a low order of efficacy. The author concludes that rabbits are not satisfactory animals for testing drugs to be used against *T. axei* in ruminants. J.M.W.

(39bd) Rowan briefly describes a method of raising large numbers of sexually mature *Australorbis glabratus* for experimental purposes. The author is able to obtain between 500 and 800 snails weekly by the use of six ten-gallon glass aquaria. P.K.

40—Journal of Pharmacy and Pharmacology. London.

a. WATKINS, T. I., 1958.—" The chemotherapy of helminthiasis." **10** (4), 209–227.

41—Journal of the South African Veterinary Medical Association.

a. DORRINGTON, J. E., 1958.—" The treatment of lungworm in sheep." **29** (1), 63–64.

b. LITTLEJOHN, A., 1958.—" Mesenteric thrombosis in equines: with a note on a possible line of treatment." **29** (1), 67–69.

(41a) In a flock of 250 Merino sheep suffering from *Dictyocaulus* infection deaths were occurring almost daily. But as a result of giving Helmox orally to 190 Merino sheep and Dictycide subcutaneously to 56 coughing Merino sheep the mortality dropped suddenly, the coughing decreased rapidly and the general conditions of the flock improved markedly. No adverse symptoms were observed. R.T.L.

(41b) The administration of sodium nitrate intravenously to an old draught mare with symptoms of mesenteric thrombosis gave almost immediate although only temporary relief from the colic symptoms. At autopsy numerous parasitic larvae were found associated with a well developed thrombus in the anterior mesenteric artery. R.T.L.

42—Journal of the Tennessee Academy of Science.

a. JONES, A. W., CHENG, T. C. & GILLESPIE, R. F., 1958.—"*Ophiotaenia gracilis* n.sp., a proteocephalid cestode from a frog." **33** (1), 84–88.

(42a) Jones *et al.* describe a proteocephalid cestode, *Ophiotaenia gracilis* n.sp. from *Rana catesbiana* from Virginia, U.S.A. The specimens are compared with four closely related North American species, viz., *O. magna* Hannum, 1925, *O. saphena* Osler, 1931, and *O. olor* Ingles, 1936, all parasites of species of *Rana*, and *O. cryptobranchi* La Rue, 1914 from *Cryptobranchus allegheniensis*. In Jones' opinion, fuller study of the genus *Ophiotaenia* may prove this new species to be of sub-specific rank. There are eight figures and 14 references. J.M.

43—Journal of Tropical Medicine and Hygiene.

a. SHAFEI, A. Z., 1958.—" Clinical trials of a new synthetic compound for treatment of bilharziasis. A preliminary report." **61** (1), 12–16.

b. CRIDLAND, C. C., 1958.—" Ecological factors affecting the numbers of snails in a permanent stream." **61** (1), 16–20.
c. KIRK, R., 1958.—" Acute pancreatitis due to ascariasis." **61** (2), 51–52.
d. WADDY, B. B., 1958.—" Frontiers and disease in West Africa." **61** (4), 100–107.

(43a) Preparation 17581 (hydrochloride of I-B-diethylamino-ethylamino-4,6,8-trimethyl-5-azathioxanthone), which had been claimed to possess marked antibilharzial activity in mice, was found to produce a 33% cure rate in 30 cases of urinary bilharziasis (due to *Schistosoma haematobium*) receiving an average total dose of 100 mg. per kg. body-weight given within ten days, and a 25% cure rate in 30 similar cases receiving 200 mg. per kg. over 21 to 24 days. The period of post-treatment observation was two months. Relatively higher daily doses for longer periods could not be given because of the increased side effects, which were similar to those of other miracil compounds. It is suggested that repetition of a course of 200 mg. per kg. given over a period of 20 days may yield a higher rate of cure. J.M.W.

(43b) Cridland found that fluctuation in populations of *Biomphalaria sudanica tanganikana* in a permanent stream in Uganda was due rather to over-population than to trematode infection. *Limnaea exserta* in the same stream showed greater fluctuations in population size and was also more susceptible to parasitism than *B. sudanica tanganikana*. In both species there was a sudden increase in the numbers of young snails after the onset of the April rains. Both these snail species have been found naturally infected with *Schistosoma mansoni* in this habitat, and figures are given showing variation of infection-rate at different times of the year. *L. exserta* will act as intermediate host of *Fasciola* [species not stated]. J.M.W.

(43d) Waddy stresses the necessity of international co-operation in combating disease in West Africa. Elimination of onchocerciasis in this region will necessitate the eradication of *Simulium damnosum* from the area of the Red and White Volta rivers by the use of D.D.T., thus creating a north-south barrier that the fly could not possibly pass. From this barrier, control work could progress east and west with no fear of reinfestation from behind. J.M.W.

44—Lancet.

a. MAEGRAITH, B., 1958.—" Schistosomiasis in China." Year 1958, **1** (7013), 208–224.

(44a) Maegraith gives his impressions of the nation-wide scheme now being organized by the Ministry of Health in the Republic of China for the control of schistosomiasis japonica and gives illustrations of ditch spraying with calcium arsenate and the use of petrol flame throwers to destroy the molluscan vectors on the banks of canals. Other methods which proved valuable were the conversion of rice fields to other crops and the reclamation of low or flood land. The removal and burying of mud, from the sides of the canals and ditches, during the winter months resulted in a reduction of the snails by 98%. R.T.L.

45—Medical Officer. London.

a. MACLEAN, R. D., 1958.—" Imported intestinal parasites." **99** (5), 61–62.

(45a) During a routine examination of employees of the Metropolitan Water Board the faeces of all workers from overseas were examined microscopically and by culture. Of the first 21 coloured workers so investigated the number of cases of helminthic infections detected were eight *Ascaris lumbricoides*, five *Trichuris trichiura* and six hookworm. With one exception all had come from the West Indies. It is pointed out that immigrants are not medically examined either on arrival or prior to departure from their own country if they come from British overseas territories. R.T.L.

46—Meditsinskaya Parazitologiya i Parazitarnie Bolezni. Moscow.

a. LUKASHENKO, N. P., 1958.—[Antigenic properties of helminth antigens obtained by various methods from *Trichinella spiralis* larvae.] **27** (1), 82–88. [In Russian: English summary p. 88.]
b. KROTOV, A. I. & KATS, K. M., 1958.—[The effect of oxygen and oil of chenopodium on helminths.] **27** (1), 89–94. [In Russian: English summary p. 94.]
c. YUFA, E. Y., 1958.—[The course of epidemic hepatitis in children infected with Ascaris.] **27** (1), 109. [In Russian.]
d. DZHEMS-LEVI, D. E. & IMMAMETOVA, A. D., 1958.—[A case of ascariasis of the liver and pancreas.] **27** (1), 109. [In Russian.]
e. LISITSKAYA, L. S., 1958.—[Biology of *Opisthorchis felineus* and the spread of opisthorchiasis in Rostov district.] **27** (1), 109–110. [In Russian.]
f. MIRETSKAYA, R. L., SNIGIREVA, O. V., SAMSONOVA, N. F. & PUZEI, O. V., 1958.—[The prevalence of opisthorchiasis in the Chernigov region.] **27** (1), 110. [In Russian.]
g. MESHMAN, M. D., MUSHINSKI, E. D. & TIKHOMIROVA, N. I., 1958.—[Treatment of trichuriasis by diathermy.] **27** (1), 111. [In Russian.]
h. ORMELI, N. Y., 1958.—[A case of pronounced eosinophilia in trichostrongylosis.] **27** (1), 111. [In Russian.]
i. SEMENOVA, V. N., 1958.—[Epidemiology of ascariasis in Rostov-on-Don. (Preliminary report).] **27** (2), 137–141. [In Russian: English summary p. 141.]
j. PETROV, A. M., 1958.—[The modern conceptions of epizootiology and epidemiology of echinococcosis.] **27** (2), 141–148. [In Russian.]
k. GAENKO, G. P., 1958.—[The distribution of echinococcosis in Altai Territory. Report I.] **27** (2), 148–150. [In Russian.]

(46a) The antigens prepared from dried *Trichinella spiralis* larvae were saline extract, polysaccharide fraction using a modification of Freeman's (1942) method, acid-soluble protein fraction using Melcher's (1943) method and, using Boiven's method, an antigen which was shown chemically to be another polysaccharide fraction. The polysaccharide fractions did not stimulate antibody production when injected into rabbits and are therefore considered to be haptenes. The protein fraction and the saline extract proved to be good antigens. G.I.P.

(46b) Small amounts of oxygen stimulate the activity of Ascaris and are harmless, as 1 gm. of worm tissue contains enough catalase to neutralize 0·8874 mg. of hydrogen peroxide in one hour at 20°C. With larger doses of oxygen the movement of the worms decreases, followed by irreversible contraction due to the accumulation of hydrogen peroxide in the tissues. The action of oxygen is enhanced by various anthelmintics and antibiotics which raise the aerobic respiration of helminths, such as santonin and piperazine for ascarids. Chenopodium oil emulsion acts similarly on the mobility of Ascaris but the mechanism is different, as the activity of catalase is only partially reduced and no hydrogen peroxide accumulates, the oil acting through its own toxicity. G.I.P.

(46c) From an analysis of the case histories of "Botkin's disease" in 71 children, Yufa finds that the symptoms of hepatitis are aggravated by Ascaris infection. G.I.P.

(46e) In the Don basin, 52 out of 100 cats and 5 out of 100 *Arvicola amphibius* were infected with *Opisthorchis felineus*. Metacercariae were found in 15–20% of 250 cyprinid fish. When local *Bithynia leachi* infected with cercariae were fed to the fish, *O. felineus* larvae developed in four months. G.I.P.

(46g) When patients with trichuriasis were given methylene blue for three days preceding the diathermic treatment, 51 out of 88 were cured and when the dye was given during the first three days of the diathermic treatment, 69 out of 103 were cured. G.I.P.

(46j) Petrov summarizes literature on the existence and occurrence of *Echinococcus granulosus* and *E. multilocularis*, the two species of *Echinococcus* of medical and veterinary importance. G.I.P.

(46k) In the Altai Territory the occurrence of hydatid in man and domestic animals is focal, being particularly severe in the Gorno-Altai region. Both the unilocular and the alveolar types were found in man. In the liver the alveolar type occurred in 83 out of 155 cases and in the lung in 3 out of 22 cases. G.I.P.

46—Meditsinskaya Parazitologiya i Parazitarnie Bolezni. Moscow (cont.)

l. CHIRKOVA, A. F., ROMANOVA, N. P. & SHMALGAUZEN, V. I., 1958.—[The epidemiology of alveolar echinococcosis in the tundra zone of the European part of the U.S.S.R.] **27** (2), 150–152. [In Russian.]

m. BULGAKOV, V. I., 1958.—[On the diagnostic value of certain reactions in echinococcosis and their technique.] **27** (2), 152–157. [In Russian: English summary pp. 156–157.]

n. ABASOV, K. D., 1958.—[Certain problems of epidemiology of taeniasis in the Azerbaijan S.S.R.] **27** (2), 157–165. [In Russian: English summary p. 165.]

o. TARAYAN, A. M., 1958.—[Four years' experience of taeniasis control in the region of the First United Hospital in Leninakan.] **27** (2), 165–169. [In Russian: English summary pp. 168–169.]

p. GORODILOVA, I. I., 1958.—[Measures for the eradication of Hymenolepis infection as a common disease in the Uzbek S.S.R.] **27** (2), 169–171. [In Russian.]

q. MARTINOV, V. F., 1958.—[The problem of the spread of opisthorchiasis among people, certain carnivorous animals and fish in the Khanty-Mansiysk area of the Tyumen region.] **27** (2), 172–173. [In Russian.]

r. GEFTER, V. A., LEVITANSKAYA, P. B. & SHIGINA, E. A., 1958.—[A new method of helminthological examination of dust from household effects by a vacuum cleaner.] **27** (2), 173–176. [In Russian: English summary p. 176.]

(46l) The helminths present in 52 out of 55 polar foxes from the tundra zone of the European part of the U.S.S.R. were *Toxascaris leonina* (90·9%), *Echinococcus multilocularis* (49·1%), *Taenia* sp. (32·7%), *Diphyllobothrium* sp. (1·8%), *Capillaria plica* (1·8%), *Spirocerca arctica* (1·8%) and *Thominx aerophilus* (1·8%). Three of the foxes were not infected. The strobilae of the *Echinococcus* found were identical with those described for *E. sibiricensis*. G.I.P.

(46m) The Casoni test was made in 200 patients with hydatid before surgical treatment, 388 patients with other diseases and 180 healthy persons used as controls. Although the positive reaction was specific, the negative reaction did not prove the absence of hydatid. Prolonged boiling of cyst fluid did not affect its antigenic properties and an extract from the dried cyst wall was an equally good antigen. Although eosinophilia frequently accompanies hydatid disease it is not of great diagnostic value, while palpation of the infected organ to provoke eosinophilia is dangerous since it may cause complications. G.I.P.

(46o) For four years the population in an area of Leninakan was mass-examined for taeniasis and those infected were treated in hospital with male fern extract. In 72% the passing of one or more scolices was observed after dosing and 87% were found to be cured on examination about three months later. An infection rate of 0·8% of the population in 1953 was reduced to 0·2% in 1956. The treatment was accompanied by sanitary instruction. G.I.P.

(46p) In the Uzbekistan region, *Hymenolepis* infection of children in institutions, schools and on playgrounds varied from 10% to 20% and was transmitted by personal contact and during toilet function. In the town of Tashkent, where treatment with male fern extract alone or in combination with other anthelmintics was accompanied by prophylactic and hygienic measures, the infection in 100 institutions was reduced from 14·7% to 4·8% in five years. In the town of Samarkand however, where only the treatment was applied, infections remained at 10·4% to 16·6% and in many playgrounds at up to 20% to 30% and over. Domestic rodents are not important as carriers for, in Samarkand, only 1·3% were found infected. G.I.P.

(46q) In the Tyumen region various cyprinid fish were examined for *Opisthorchis felineus* metacercariae. Those from rivers were on the whole heavily infected but those from large lakes were free of infection. The snail host, *Bithynia leachi*, inhabits only the small creeks and was not found in the main stream of rivers or in lakes. The average infection rate of silver-black foxes in the region was 7·6% and all the cats and dogs examined were infected. [The human infection mentioned in the title is not given.] G.I.P.

(46r) To collect dust for examination for helminth ova from household effects, the tube on a vacuum cleaner was replaced by rubber tubing to which was attached a funnel fitted with a porous plate on which a membranous filter was placed. The dust sample from each article, collected in a separate funnel, was then examined microscopically. If the dust layer was thick

46—Meditsinskaya Parazitologiya i Parazitarnie Bolezni. Moscow (cont.)

s. KURDINA, A. A., MALININA, K. N. & PANFEROVA, E. A., 1958.—[The problem of interrelationship of dysentery with lambliasis and helminthiasis.] **27** (2), 183–188. [In Russian.]
t. FROLOVA, V. G., KRAVCHUK, V. F. & DOBRININA, I. L., 1958.—[The epidemiology of ascariasis in Stalinsk.] **27** (2), 215. [In Russian.]
u. BERDINSKIKH, M. I. & BAIGULOVA, S. A., 1958.—[Oxygen in the treatment of helminth infections.] **27** (2), 216. [In Russian.]
v. GEFT, V. M., 1958.—[Complicated cases of intestinal ascariasis.] **27** (2), 216. [In Russian.]
w. MITCHENKO, I. K., 1958.—[Eosinophilia in helminthiasis in dysenteric patients.] **27** (2), 216. [In Russian.]
x. SINOVICH, L. I., 1958.—[Helminth infections in the population of Takhtinsk district of the Nizhni-Amur region.] **27** (2), 217. [In Russian.]
y. PASTERNAK, N. D., 1958.—[A case of true dicrocoeliasis in man.] **27** (2), 217. [In Russian.]
z. POLUEKTOV, A. M., 1958.—[Description of an outbreak of trichinelliasis in Kirov.] **27** (2), 218. [In Russian.]
ba. GALYAMINA, V. D., 1958.—[A local case of strongyloidiasis in Kuybyshev.] **27** (2), 218. [In Russian.]
bb. GIGITASHVILI, M. S., 1958.—[A comparative evaluation of methods of treating taeniasis.] **27** (2), 218. [In Russian.]
bc. VASK-MARINA, N. L. & GELLER, F. I., 1958.—[*Hymenolepis* of murids and *Dipylidium* infection in man in Tashkent. Case reports.] **27** (2), 218–219. [In Russian.]
bd. KASYANOVA, K. A. & GLEBOVA, A. A., 1958.—[A case of *Dipylidium* infection in man.] **27** (2), 219. [In Russian.]
be. CHUN-SYUN, F., 1958.—[*Dracunculus* infection in dogs in Kazakhstan.] **27** (2), 219–220. [In Russian.]
bf. KRASOVITSKI, Z. I., 1958.—[The influence of concomitant ascariasis on the course of dysentery.] **27** (2), 229. [In Russian.]
bg. RUBSHTEIN, M. E. & LEVCHENKO, K. I., 1958.—[The treatment of trichuriasis in children by aqua-benzine enemas.] **27** (2), 229. [In Russian.]

the technique used for soil samples was applied. Washings from the funnel walls were also examined. Ova were found in 54% of dust samples collected by this method from children's homes as compared to 21·5% of similar samples collected by the usual swab method. G.I.P.

(46u) The authors prefer two courses of oxygen therapy with an interval of one month, to one course for the treatment of ascariasis and trichuriasis in man, and the prior administration of oxygen in the treatment of mixed infections of Ascaris and Taenia. G.I.P.

(46x) In one village of Takhtinsk where the population was engaged in hunting and in fishing in a nearby lake, the infections were *Metagonimus* 7·8% and *Diphyllobothrium* 3·8%, while in another fishing village lying on the right bank of the river Amur 76·4% of the population were infected with *Metagonimus*, 8·2% with *Diphyllobothrium* and a few with *Clonorchis*. G.I.P.

(46y) The history is given of the eleventh case of human infection with *Dicrocoelium dendriticum* in Russia. G.I.P.

(46bb) The treatment of taeniasis with acrichin was effective in 81·2% of 342 patients, with *Punica granatum* bark extract in 70·3% of 185 patients and with filixan in 64·5% of 310 patients. G.I.P.

(46bc) The authors briefly describe the symptoms observed in two small girls, one infected with a murid *Hymenolepis* [*?H. diminuta*] and the other with *Dipylidium*. G.I.P.

(46be) *Dracunculus* in man and dogs was unknown in Kazakhstan until 1955–56 when 11·7% of 213 stray dogs examined in Kyzyl-Orda were found to be infected with *D. medinensis*. A careful examination of cyclops from various small collections of water on the edge of the town gave negative results. The author suggests that canines and not man are the principal definitive hosts of *D. medinensis*. G.I.P.

(46bg) Trichuriasis was cured in 25 out of 28 children by enemas consisting of 1 c.c. of benzine, for each year of age, thoroughly mixed with 80 c.c. of boiled water at 26°C. to 27°C. The mixture was slowly intubated into the rectum on five consecutive days after a preliminary cleansing enema and the whole treatment repeated after 12 to 14 days. No side effects were observed. G.I.P.

47—Nature. London.

a. HENDERSON, V. E., 1958.—" Relationship between some clovers and *Ditylenchus destructor* Thorne, 1945." [Correspondence.] **181** (4601), 59–60.
b. SAUER, M. R., 1958.—" Development of eggs before the final moult in *Pratylenchus*." [Correspondence.] **181** (4602), 129.
c. SPEDDING, C. R. W., BROWN, T. H. & WILSON, I. A. N., 1958.—" Growth and reproduction in worm-free sheep at pasture." **181** (4603), 168–170.
d. COPP, F. C., STANDEN, O. D., SCARNELL, J., RAWES, D. A. & BURROWS, R. B., 1958.—" A new series of anthelmintics." [Correspondence.] **181** (4603), 183.
e. LEACH, R., 1958.—" Blackhead toppling disease of bananas." [Correspondence.] **181** (4603), 204–205.
f. McTAGGART, H. S., 1958.—" *Cryptocotyle lingua* in British mink." [Correspondence.] **181** (4609), 651.
g. CROSSKEY, R. W. & CROSSKEY, M. E., 1958.—" Filarial infection in *Simulium griseicolle* Becker." [Correspondence.] **181** (4610), 713.
h. PERKINS, E. J., 1958.—" Microbenthos of the shore at Whitstable, Kent." [Correspondence.] **181** (4611), 791.
i. ELLENBY, C., 1958.—" Root diffusates of *Solanum tuberosum* and *Digitalis purpurea*." [Correspondence.] **181** (4613), 920–921.
j. STEWART, D. F. & GORDON, H. McL., 1958.—" Immune reactions to *Trichostrongylus colubriformis* infestation in sheep." [Correspondence.] **181** (4613), 921.

(47a) Plot experiments showed that various legumes, viz., *Trifolium pratense*, *T. hybridum*, *T. repens*, *Melilotus officinalis* and *Medicago sativa* caused population increases of *Ditylenchus destructor* in their rhizospheres. Root necrosis, which may be of fungal origin, was observed in all the plants mentioned except *M. sativa*. The suggestion is made that the nematodes' increase is correlated with their feeding on the fungi in the necrotic roots. J.B.G.

(47b) Females of a species of *Pratylenchus* (believed to be *P. minyus*) were found in which eggs, containing second-stage larvae, were contained within the hind part of the moulting cuticle. It appears that under some circumstances the females can produce embryonated eggs before the final moult, these being laid as the vulva opens when the eelworm becomes fully adult. It could not be determined if reproduction had quickened or moulting had been retarded. J.B.G.

(47c) Growth rates of two groups of ewe lambs are compared. The first group (Group F) were "worm free" while the second (Group I) were the best ewe lambs selected from the farm flock. In spite of the fact that Group I were on better pasture than Group F, the latter were, on average, 17 lb. per head heavier at tupping and 32 lb. per head heavier just prior to lambing. Group F produced significantly heavier single lambs. The difference in the live-weight gain between the barren ewes appears to be greater than that between ewes that have lambed in the two groups. These results seem to indicate that the effect of a sub-clinical worm infestation in barren ewe lambs causes a depression of the growth rate similar to that described for other sheep but in pregnant ewes the effect may be suffered entirely by the developing foetus and associated maternal tissues. D.M.

(47d) The general formula is given for a new series of chemical compounds which appear to have anthelmintic activity against a wide range of gastro-intestinal nematodes in mammals. Some of them are more effective against forms in the mucosa than in the lumen of the gut. Field and clinical trials are in progress. R.T.L.

(47e) The replacement of Gros Michel banana by Lacatan because of Panama disease has led to the increase of Blackhead disease because the latter variety is highly susceptible to Blackhead. The roots and corms of diseased plants are extensively invaded by *Radopholus similis* and other secondary organisms, particularly the roots which become destroyed. The eelworms are to be found in small lesions on young roots and at the junction of healthy and rotten tissue. J.B.G.

(47f) The first occurrence of *Cryptocotyle lingua* in British farm mink is reported. Adult parasites were collected from one out of 37 mink examined and the characteristic eggs were found in the rectal faeces. In the intestinal contents of another mink, small numbers of eggs of *C. lingua* and *C. concava* were present but no adults were found. R.T.L.

(47g) Infective filarial larvae were present in 1·25% of *Simulium griseicolle* collected from the window panes of the rest-house at Lokoja in Northern Nigeria and 0·93% contained caudate sausage forms, making a total of 2·18%. The identity of the parasite and that of its definitive host are still unknown. R.T.L.

(47h) In sandy flats on the shore at Whitstable, where fine sand averaging 7 cm. in depth overlies London clay, large numbers of free-living nematodes are present below the surface but none were found in the clay. The nematodes moved actively on the surface of the shore during a three-hour exposure period and in the water when the sand was covered by the sea. They also exhibited a tidal rhythm. R.T.L.

(47i) The properties of foxglove and potato-root diffusates are similar in that they both possess cardiotonic activity. When submitted to colorimetric assay the wavelengths of the absorption peaks are closely similar for both diffusates. Furthermore both diffusates show peroxide activity after concentration. Ellenby concludes that this evidence coupled with chemical evidence from other sources supports the hypothesis that the two diffusates contain substances which have a chemical affinity with each other and with the cardiac glycosides. H.R.W.

(47j) Stewart & Gordon found that in some sheep infected with *Trichostrongylus colubriformis* and then challenged with larvae, the body-weight remained the same, or even declined, although the faecal egg count was virtually negative and the serum antibody titre remained high. When killed very numerous adult *T. colubriformis* were present in the small intestine but the females contained few eggs. Although the worms had reached maturity in the normal time there had been a marked suppression of egg production associated with the high serum titre; it is pointed out therefore that in these cases faecal egg counts are not reliable indications of the degree of infestation. S.W.

48—Nematologica.

a. GOODEY, J. B., 1958.—" *Paraphelenchus myceliophthorus* n.sp. (Nematoda: Aphelenchidae)." **3** (1), 1–5. [German summary p. 5.]
b. WIDDOWSON, E., 1958.—" Potato root diffusate production." **3** (1), 6–14. [German summary pp. 13–14.]
c. LUC, M., 1958.—" Trois nouvelles espèces africaines du genre *Hemicycliophora* de Man, 1921 (Nematoda: Criconematidae)." **3** (1), 15–23. [English summary p. 23.]
d. GOODEY, J. B. & HOOPER, D. J., 1958.—" Observations on the effects of *Ditylenchus dipsaci* and *Anguina tritici* on certain wheat and barley varieties." **3** (1), 24–29. [German summary pp. 28–29.]
e. OOSTENBRINK, M., 1958.—" An inoculation trial with *Pratylenchus penetrans* in potatoes." **3** (1), 30–33. [German summary p. 33.]
f. LOOF, P. A. A. & OOSTENBRINK, M., 1958.—" Die Identität von *Tylenchus robustus* de Man." **3** (1), 34–43. [English summary pp. 42–43.]
g. ANDRÁSSY, I., 1958.—" *Hoplolaimus tylenchiformis* Daday, 1905 (Syn. *H. coronatus* Cobb, 1923) und die Gattungen der Unterfamilie Hoplolaiminae Filipjev, 1936." **3** (1), 44–56. [English summary p. 55.]
h. LUC, M., 1958.—" *Xiphinema* de l'Ouest Africain: description de cinq nouvelles espèces (Nematoda: Dorylaimidae)." **3** (1), 57–72. [English summary p. 71.]
i. THOMAS, P. R., 1958.—" Severe eelworm (*Ditylenchus dipsaci* (Kühn) Filipjev) infestation of the narcissus variety Soleil d'Or." **3** (1), 73–78. [German summary p. 78.]
j. TARJAN, A. C., 1958.—" Note on the selection of types for certain nematode species." **3** (1), 79–80.
k. ELLENBY, C., 1958.—" Day length and cyst formation in the potato root eelworm, *Heterodera rostochiensis* Wollenweber." **3** (2), 81–90. [German summary p. 90.]
l. GOODEY, J. B., 1958.—" *Ditylenchus myceliophagus* n.sp. (Nematoda: Tylenchidae)." **3** (2), 91–96. [German summary p. 96.]

m. SAUER, M. R., 1958.—" *Hoplolaimus gracilidens*, *Radopholus inaequalis*, and *Radopholus neosimilis*, three new tylenchs native to Victoria, Australia." **3** (2), 97–107. [German summary p. 107.]

n. WIDDOWSON, E., 1958.—" The production of root diffusate by potatoes grown in water culture." **3** (2), 108–114. [German summary pp. 113–114.]

o. DROPKIN, V. H., MARTIN, G. C. & JOHNSON, R. W., 1958.—" Effect of osmotic concentration on hatching of some plant parasitic nematodes." **3** (2), 115–126. [German summary pp. 125–126.]

p. SHEPHERD, A. M., 1958.—" Experimental methods in testing for resistance to beet eelworm, *Heterodera schachtii* Schmidt." **3** (2), 127–135. [German summary pp. 134–135.]

q. WINSLOW, R. D., 1958.—" The taxonomic position of *Anguillulina obtusa* Goodey, 1932 and 1940." **3** (2), 136–139. [German summary p. 138.]

r. PAETZOLD, D., 1958.—" Beobachtungen zur Stachellosigkeit der Männchen von *Hemicycliophora typica* de Man, 1921 (Criconematidae)." **3** (2), 140–142. [English summary p. 142.]

s. BISHOP, D., 1958.—" A technique for screening antibiotics against eelworms." **3** (2), 143–148. [German summary p. 148.]

t. HAGUE, N. G., 1958.—" The concentration of potato root diffusate under reduced pressure." **3** (2), 149–153. [German summary p. 153.]

u. CARROLL, K. K., HEYES, J. K., JOHNSON, A. W. & TODD, A. R., 1958.—" The potato eelworm hatching factor. 7. Further methods for concentration of the factor." **3** (2), 154–167. [German summary p. 166.]

(48a) *Paraphelenchus myceliophthorus* n.sp. is described and figured. The nematode attacks the mycelium in compost of cultivated mushroom beds. The excretory duct joins the pore to a ventral uninucleate cell. The species is characterized by the pattern of papillae on the male tail and the absence of a mucron on the female tail. J.B.G.

(48b) This paper deals with some aspects of the root diffusate output of Arran Banner potatoes grown in 6½-inch pots of coarse sand. The age of the plants affected the potency of the diffusate. Leachings taken about four weeks after the emergence of the shoot were the most active, those taken six weeks after emergence were unreliable. Potatoes grown in sand inoculated with potato-root eelworm cysts to give populations of 21, 45 and 102 eggs per gm. of sand showed increased rates of root growth and diffusate output in response to the two lower infestations. In a comparison with the tomato variety Moneymaker, the potatoes produced more diffusate per unit weight of root during the first nine weeks of growth. Active root leachings were obtained from the potato varieties Epicure, Arran Pilot, Eclipse, Duke of York, Great Scot, Gladstone, Arran Banner, King Edward, Ulster Chieftain, and Majestic; the King Edward and Duke of York varieties were the least active in two experiments. E.W.

(48c) The number of bisexual species of *Hemicycliophora* is raised to five by the description of *H. oostenbrinki* n.sp. and *H. paradoxa* n.sp. A third species is described, *H. pauciannulata* n.sp., in which no males were found but which has a spermatheca. All three species have a hemizonid. *H. pauciannulata* n.sp. was found in Togo around the roots of *Cocos nucifera* (coconut) suffering from "Kaincopé" disease. It is characterized by having only 174–206 annules and differs from *H. conida* Thorne, 1955 in having the larval cuticle clearly detached from the body, no ornamentation of the lateral field and in having a hemizonid and a spermatheca. *H. oostenbrinki* n.sp. is common in the Ivory Coast and Guinea round the roots of *Musa paradisiaca* (banana); it often occurs in large numbers and is always associated with tylenchids. It is close to *H. membranifer* but differs in having a narrower lateral field marked in squares instead of rectangles by the transverse annulations, the tail is longer, conical and attenuated, the male oesophageal bulb is only slightly developed but distinct and the spicules are curved almost into a circle; the gubernaculum and sheath are very well developed. *H. paradoxa* n.sp. has been found at one place, near Abidjan, near the roots of *Pennisetum typhoideum*. The females differ from *H. micoletzkyi* by the smaller number of annules (256–263 instead of 400) and the shorter stylet (61–65 μ instead of 132 μ), while the males differ from all others in the genus in having nearly straight spicules. M.T.F.

(48d) Following the report in 1954 by Belloni that in Italy, *Triticum aestivum* L. was attacked by *Ditylenchus dipsaci*, varieties of wheat, barley and rye were tested for their reactions

to *D. dipsaci*, derived from oats in Britain, and *Anguina tritici*. No variety of any cereal was attacked by *D. dipsaci* but all the wheats, including several Italian varieties were susceptible to *A. tritici*. It appears that the race of *D. dipsaci* attacking wheat in Italy is biologically different from the oat race of Britain. In Britain there is no real danger of attack by *D. dipsaci* on wheat or barley. Resistance of wheat to *D. dipsaci* does not infer resistance to *A. tritici*. J.B.G.

(48e) By continuing an inoculation experiment for a second year Oostenbrink showed that *Pratylenchus penetrans* caused retarded growth of pot-grown potatoes, although no effects showed the first year. This retarded growth was correlated with increased populations of *P. penetrans*. J.B.G.

(48f) Filipjev based his genus *Rotylenchus* on *Tylenchus robustus* de Man, 1876 as described by de Man in 1880. The authors have examined specimens of *T. robustus* mounted and labelled by de Man in 1879. They conclude that the descriptions of 1876, 1880 and 1884 were all of the same eelworm which, from the specimens they examined, they say is the same as *Hoplolaimus uniformis* Thorne, 1949. *H. uniformis* is made a synonym of *Rotylenchus robustus*; *R. robustus* as described by Goodey, 1932, 1940 and 1951, Thorne, 1949, Filipjev & Schuurmans Stekhoven, 1941 and Golden, 1956 is renamed *Rotylenchus goodeyi* Loof & Oostenbrink, 1958. J.B.G.

(48g) Andrássy reviews the Hoplolaiminae. He redescribes *Hoplolaimus tylenchiformis* Daday, 1905 from specimens of *H. coronatus* which he synonymizes with it. His review produces the following results: *Hoplolaimus* with two species, *H. tylenchiformis* (type) and *H. proporicus* Goodey, 1957; *Rotylenchus* with a single species *R. robustus* (de Man, 1876) Filipjev, 1936; *Helicotylenchus* with six species, *H. nannus* Steiner, 1945 (type), *H. africanus* (Micol., 1915) Andrássy, 1958, *H. erythrinae* (Zimmerman, 1904) Golden, 1956, *H. iperoiguensis* (Carvalho, 1956) Andrássy, 1958, *H. melancholicus* (Lordello, 1955) Andrássy, 1958 and *H. multicinctus* (Cobb, 1893) Golden, 1956; *Gottholdsteineria* Andrássy, 1958 with four species, *G. goodeyi* (Loof & Oostenbrink, 1958) Andrássy, 1958 (type), *G. buxophila* (Golden, 1956) Andrássy, 1958, *G. pararobusta* (Sch. Stek. & Teunissen, 1938) Andrássy, 1958 and *G. quarta* Andrássy, 1958 [which appears to be a nomen nudum]; *Scutellonema* Andrássy, 1958 with six species *S. blaberum* (Steiner, 1937) (type), *S. boocki* (Lordello, 1957), *S. brachyurum* (Steiner, 1938); *S. bradys* (Steiner & Le Hew, 1933), *S. christiei* (Golden & Taylor, 1956) and *S. coheni* (J. B. Goodey, 1952). J.B.G.

(48h) In soil from different parts of French West Africa, Luc has found seven species of *Xiphinema* comprising *X. diversicaudatum* (Micoletzky) Thorne, *X. campinense* Lordello, and five new species. *X. hallei* n.sp. differs from *X. insigne* Loos in being longer, having a longer stylet, only three pairs of papillae on the female tail instead of seven, the vulva at 46·7% as compared with 30–32% and no cuticularized triangle in the oesophageal wall. *X. yapoense* n.sp., of which only females were found, has a bluntly rounded tail but differs from *X. obtusum* Thorne in its greater length (3 mm. as compared with 0·8 mm.) and in the hemispherical, distinctly offset lips. The females of *X. ebriense* n.sp. differ from all other described species in having a "Z organ". This is a spherical bulb with strong circular muscles and two to four tooth-like sclerotized plates in the lining. It is situated between the spermatheca and the uterus with both of which the lumen is continuous. Its function is unknown. The male is characterized by the number and arrangement of the papillae. Only females are known for *X. setariae* n.sp. and *X. parasetariae* n.sp. Neither species has a cardia but *X. setariae* has a cuticularized triangle in the oesophageal wall. *X. parasetariae* is more slender than *X. setariae* (a = 70 as compared with 50–55) and it has a finer tail and no cuticular striations or ventral pores. M.T.F.

(48i) As well as the usual signs of attack, the narcissus Soleil d'Or may show slimy decay when heavily attacked by *Ditylenchus dipsaci*. Unlike other varieties the nematodes are mostly found in the foliage leaves including their bases and not in the scale leaves of the bulb. J.B.G.

(48j) Tarjan gives the numbers and locations of the slides on which are mounted the lectotypes of *Hemicycliophora parvana* Tarjan, 1952 and *Tylencholaimus brevicaudatus* (Tarjan, 1953) Tarjan, 1956, and the neotype of *Xiphinema americanum* Cobb, 1913. Tarjan has received further evidence of the absence of de Man's original specimen of *Ecphyadophora tenuissima* de Man, 1921, thereby justifying Tarjan's establishment in 1957 of a neotype for this nematode. M.T.F.

(48k) Ellenby grew three potato varieties in pots of sterile sand with added fertilizer, half the pots receiving unrestricted daylight throughout the life of the plants, the others receiving restricted daylight after the first two months. At this time all pots were inoculated with *Heterodera rostochiensis* cysts, from potato roots, contained in stainless steel gauze baskets. These were withdrawn 19 days later and the emerged larvae estimated. At the end of the experiment, new cysts formed were recovered, cyst contents estimated and cyst volumes calculated. Day length did not affect larval emergence (Majestic causing greater emergence than the other two varieties) but did affect cyst numbers in the case of Doon Star and Redskin, short day giving fewer cysts which tended to be smaller but more densely packed with eggs. Ellenby concludes that growth conditions may influence not only cyst numbers and size but also egg concentration and, presumably, hatching response. R.D.W.

(48l) *Ditylenchus myceliophagus* n.sp. which destroys mushroom mycelium, is described and figured. It differs morphologically from its nearest relative *D. destructor* in the broader finger-like tails of both sexes, in the shape of the spicules and the shorter post-vulval sac. J.B.G.

(48m) *Rotylenchus gracilidens* n.sp. (described in the main part of the paper as *Hoplolaimus gracilidens* and transferred, in a footnote, following Loof & Oostenbrink, to *Rotylenchus*), *Radopholus inaequalis* n.sp. and *R. neosimilis* n.sp. are described and figured. The first, which is characterized by the pre-anal position of the phasmids and the short and slender spear, was found about the roots of *Olearia lepidophylla*. The second shows sexual dimorphism, the females have up to seven incisures, a short stout spear with unequal knobs, small head and striations going round the tail tip. The male has an elongate unstriated head, seven incisures and a large bursa. The third is close to *R. similis* but is smaller and has a shorter, blunter female tail and the male a lower, broader head and shorter tail. Both *Radopholus* spp. were found around the roots of *Codenocarpus cotinifolius*. All three nematodes occurred in *Eucalyptus* scrub in Victoria, Australia. J.B.G.

(48n) Three experiments using Arran Banner potatoes are described. In the first, the output of root diffusate from potatoes grown in a standard nutrient solution and in tap water, alternately, every one, two, four and eight days, was compared with the output from potatoes grown in water only. There was no consistent difference between the treatments except during the fourth week, when the best result was given by the plants alternated between nutrient solution and water every other day. In the second experiment the potatoes were grown only in nutrient solution which was changed every one, two, four and eight days; in the third they were grown only in distilled water, changed at the same times, the nutrients being supplied as a foliar spray. Potatoes growing in pots of sand were used as controls. In both experiments diffusate production from the hydroponic plants did not compare with that from the potted plants until the fourth week due to growth initially being very slow in water culture. E.W.

(48o) Egg masses of *Meloidogyne arenaria* and cysts of *Heterodera rostochiensis* were placed in a series of concentrations of NaCl, $CaCl_2$, KCl and dextrose. As the concentration of salt or dextrose rose, hatching was progressively inhibited. The rate of hatch rose when cysts or egg masses were transferred to water. Eggs of *M. arenaria* continue to develop in NaCl although hatching is inhibited. No motion of the unhatched larvae was observed at any stage in the NaCl series but on transference to water motion began followed by hatching. Observations on the larvae during hatching are described. The hatching of *H. rostochiensis* and *Ditylenchus dipsaci* is similarly inhibited by salt solutions. It is suggested that the inhibition

of hatching by salt solutions may be reproduced in the soil where osmotic pressure of the soil solution together with soil moisture tension would produce a soil moisture stress. It is argued that this mechanism would permit some nematodes to survive periods of long drought. It is further suggested that the influence of root diffusates on *Heterodera* spp. is to alter egg or larval permeability to permit the passage of water and of other molecules and ions; this hypothesis is based on the assumption that the absence of water is the critical factor for inhibition of activity and hatch. H.R.W.

(48p) After a short review of previous work on testing for resistance to beet eelworm, experiments on the variability arising in techniques for such tests are described. In pot tests with sugar-beet, the variation in the number of cysts on plants of the same line under standard conditions is very high for all methods of inoculation, making detection of small differences in resistance impossible. Also, seasonal conditions affect cyst production. A technique for routine screening for resistance, involving the addition of hatched larvae to seedlings in small pots, is described. Selection for tolerance to attack, and the possible occurrence of resistance-breaking biotypes are also discussed. Because of the great variation encountered in pot tests, the necessity for careful planning of experiments and care in interpretation of results where such techniques are used, is stressed. A.M.S.

(48q) A nematode found in Rothamsted turf and obviously identical with T. Goodey's *Anguillulina obtusa* has been studied. Winslow agrees with Sher & Allen (1953) [for abstract see Helm. Abs. **22**, No. 417b] that this nematode is not necessarily identical with the meagrely described *Tylenchus obtusus* Bastian, 1865; hence the specific name *obtusa* is invalid. Generically, Goodey's nematode belongs neither to *Rotylenchus*, as suggested by Filipjev in 1936, nor to *Pratylenchus*, where it was provisionally placed by Goodey in 1951. Therefore it is made the type and sole representative of a new genus *Pratylenchoides* with the new specific name *crenicauda*, descriptive of the female tail. R.D.W.

(48r) Paetzold found *Hemicycliophora typica* in two saline habitats in central Germany. There were males, females and many larvae, in which he observed moulting. In males the larval stylet was lost at the last moult and could sometimes be seen left behind in the last larval cuticle. M.T.F.

(48s) The influence of a number of antibiotics on the ability of the root-knot eelworm, *Meloidogyne incognita* var. *acrita*, to invade and develop in tomato roots was studied. Experiments failed to give any evidence that the antibiotics affected the eelworms. H.R.W.

(48t) This paper describes the method of concentrating potato-root diffusate. The "concentration of diffusate-percentage of larvae hatching" curve is hump-shaped showing that there is an optimum value for the "strength" of diffusate, and that two concentrations of root diffusate can produce similar eelworm response. For storing potato-root diffusate a concentration factor of ten appears suitable, and leachings can be distilled at 30°C. without loss of activity. J.J.H.

(48u) Previous techniques for concentrating potato-root diffusate involved the use of charcoal. Carroll states that a large proportion of the hatching factor is adsorbed on the charcoal and in view of this other methods were tried. Concentration of the root leachings *in vacuo* at temperatures below 45°C. proved to be a useful method since there was no loss of activity. An alternative procedure made use of the fact that the active factors can be adsorbed by a strongly basic ion exchange resin and subsequently displaced by mineral acid. In order to extract inorganic salts present in the concentrates the active material in acidified aqueous solution was treated with either *n*-butanol or *sec*-butanol and extracted from a neutral aqueous solution by phenol. Alternatively, the active material was adsorbed on a column of powdered cellulose, and the inactive inorganic salts and organic contaminants eluted with ethyl acetate containing increasing proportions of ethanol. Further purification of the hatching factor by

paper chromatography, counter-current distribution and silica gel chromatography failed to isolate any single active substance. Active fractions from ion-exchange columns were partitioned between butanol and water and most of the activity was found in the butanol layer suggesting that the activity is associated with acids having a high R_F in the butanol-water chromatograms. H.R.W.

49—New Zealand Journal of Agriculture.

a. HEALY, A. J., 1958.—" Eelworm (*Anguina agrostis* (Steinb.) Filipjev) in *Agrostis tenuis* Sibth. in New Zealand." **1** (2), 265–266.

(49a) Galled flowers of *Agrostis tenuis* in New Zealand were attributed to attack by *Anguina agrostis*. J.B.G.

50—New Zealand Veterinary Journal.

a. COLLYNS, D. J., 1958.—" Worm infestation after phenothiazine." [Correspondence.] **6** (1), 27.

(50a) One group of eight calves was given a proprietary anthelmintic based on phenothiazine and hexachlorethane, a second group received fine-particle phenothiazine and a third group was run with the experimental animals as controls. The egg count a month later showed three times as many eggs per gramme in the phenothiazine group as in the controls. A fortnight after the last of several monthly dosings the faeces of five of the phenothiazine group still contained 200 to 300 e.p.g. If most of the worms were killed by the phenothiazine there must have been very rapid reinfestation and it seems that some undetermined mechanism had rendered the calves more susceptible to infection after phenothiazine dosing. M.MCK.

51—Ohio Journal of Science.

a. CRITES, J. L. & PHINNEY, G. J., 1958.—" *Dirofilaria scapiceps* from the rabbit (*Sylvilagus floridanus mearnsi*) in Ohio (Nematoda: Dipetalonematidae)." **58** (2), 128–130.

(51a) *Dirofilaria scapiceps* is reported for the first time from Ohio where two *Sylvilagus floridanus mearnsi* were found infected. 76 specimens were recovered from one cottontail rabbit and 84 from the other. With the present report the parasite is now known from ten States in the U.S.A. and two provinces in Canada. M.MCK.

52—Parasitology.

a. INGLIS, W. G., 1958.—" A revision of the nematode genus *Meteterakis* Karve, 1930." **48** (1/2), 9–31.
b. BIRD, A. F., 1958.—" Further observations on the structure of nematode cuticle." **48** (1/2), 32–37.
c. JAIN, G. P., 1958.—" On the egg and miracidium of *Paryphostomum mehrai* (Faruqui)." **48** (1/2), 96–100.
d. LEE, D. L., 1958.—" A note on a species of *Syngamus* found in the intestine of *Turdus pilaris*." **48** (1/2), 121–123.
e. BELL, E. J. & SMYTH, J. D., 1958.—" Cytological and histochemical criteria for evaluating development of trematodes and pseudophyllidean cestodes *in vivo* and *in vitro*." **48** (1/2), 131–148.
f. SPRENT, J. F. A., 1958.—" Observations on the development of *Toxocara canis* (Werner, 1782) in the dog." **48** (1/2), 184–209.

(52a) Inglis reconstitutes *Meteterakis* as a distinct morphological and geographical group of the Spinicaudinae and redefines the genus. *Meteterakis* is distinguished from *Spinicauda*, *Africana* and *Heterakis* by the presence in the male of caudal alae supported by large fleshy papillae and a gubernacular mass developed from the wall of the cloaca, in the female of a valvular structure developed from the anterior lip of the vulva, and in both sexes by the excretory pore opening into a large, lobulated excretory vesicle. *Ganguleterakis* is considered to be indistinguishable from *Heterakis*. Eight species are assigned to *Meteterakis*,

namely, *M. govindi*, *M. baylisi* n.sp. and *M. louisi* n.sp., *M. cophotis*, *M. japonica* and *M. longispiculata* (transferred from *Spinicauda*), *M. mabuyi* (transferred from *Africana*), and *M. triaculeata* (transferred from *Ganguleterakis*). The morphology of these is described in detail. *M. baylisi* n.sp. from *Ceratophora stoddarti* resembles *M. longispiculata* in general appearance but may be distinguished from it by the distinctive capitate ends of the spicules in the new form. *M. louisi* n.sp. from the stomach of a "tree lizard" is distinguished from all other species of the genus by the presence of three instead of two pairs of fleshy papillae lateral to the pre-cloacal sucker and by the size and form of the spicules. *Spinicauda bufonis* and *Africana varani* are believed to be synonyms of *M. govindi*, and *A. howardi* of *M. japonica*. The species remaining in *Africana* and *Spinicauda* are listed. In an appendix the author compares his conclusions with those published by Freitas in *Rev. bras. Biol.*, **16**, 461–482. [For abstract see Helm. Abs., **25**, No. 515b.] S.W.

(52b) Bird has found that the transverse grooves of the cuticle of *Oxyuris equi* are much further apart than in *Ascaris lumbricoides* and *Strongylus equinus* and that the cuticle is much thinner; it consists of the following layers, external cortical, internal cortical, "fibrillar", two outer and two inner fibre layers and a homogeneous layer which surrounds the outer fibre layers but of which the greater part lies between the outer and inner fibre layers; there is no indication of a boundary layer or a basal lamella. The cuticle of *S. equinus* is thicker even than that of *A. lumbricoides* and consists of external and internal cortical layers, a "fibrillar" layer with structures similar to pore canals passing from the homogeneous layer to underneath the grooves of the external cortical layer, a homogeneous layer, a boundary layer, one outer and one inner fibre layer and a basal lamella. Examination of surface views of the cuticle of *A. lumbricoides* after peptic digestion affords further evidence of the existence of pore canals as described by Bird & Deutsch in a previous paper [for abstract see Helm. Abs., **26**, No. 433b]. Their possible significance is discussed. S.W.

(52c) Jain gives an account of the mature egg and miracidium of *Paryphostomum mehrai* (Faruqui). The miracidia were obtained from white rats experimentally infected with cysts of *Cercaria mehrai* from both naturally and artificially infected *Indoplanorbis exustus*. The miracidium of this species is morphologically similar to that of *Echinostoma revolutum*, but eye-spots are absent and the germ-balls are contained within a germinal sac. J.M.W.

(52d) Lee identifies as *Syngamus parvus* a pair of nematodes found *in copula* in the intestine of *Turdus pilaris*. The morphology is described and illustrated. As the bird had been shot through the lung the author considers that the nematodes were not in their normal habitat but had been displaced from the respiratory tract, although it is pointed out that it is difficult to see how they had escaped injury in the gizzard. S.W.

(52e) Bell & Smyth have studied the *in vitro* development of the plerocercoid of *Diphyllobothrium* sp. and the metacercaria of *Diplostomum phoxini* and consider development *in vitro* to be comparable with that *in vivo* when the same phases occur within the same incubation time, without the appearance of cytological abnormalities. In both the trematode and cestode the development may be divided into the following phases (i) cell multiplication, (ii) segmentation or body shaping, (iii) organogeny, (iv) early gametogeny, (v) late gametogeny, (vi) egg-shell formation and vitellogenesis and (vii) oviposition, and the authors have established cytological and histochemical criteria for the recognition of these phases. These are as follows: phase (i) mitoses counts, detected by aceto-orcein squashes after colchicine treatment; phase (ii) division into proglottides or body regions, detected by direct observation on living material or aceto-orcein squashes; phase (iii) appearance of uterus and testes primordia, detected by squashes or whole mounts; phase (iv) appearance of "rosette" and "comma" stages in spermatogenesis, detected by squashes; phase (v) appearance of mature spermatozoa, detected by squashes or unstained teases; phase (vi) presence of egg-cell precursors in vitelline cells, detected by histochemical tests on whole specimens; phase (vii) appearance of fully formed eggs, detected by direct observation on living material or catechol-treated whole

mounts. The embryonation and hatching of eggs to produce morphologically normal and infective larvae are the final criteria. The techniques involved are described and discussed and the criteria for the maintenance of adult forms are also considered. S.W.

(52f) Sprent found all of 29 puppies, one to six months old, to be naturally infected with *Toxocara canis* but only three of 29 over six months old were infected and these harboured respectively only four, one and one adults in the intestine, although one had living second-stage larvae in the kidneys. Working with natural infections he found third-stage larvae in the heart and lungs of puppy foetuses near term and in the lungs at birth. Third-stage larvae continued to appear in the lungs during the first week of life and were first found in the stomach the day after birth. Three days after birth fourth-stage larvae were found in the intestine and these were fully grown by the beginning of the second week, undergoing the fourth moult when 5–7 mm. long. The adults reached a length of 67 mm. by the end of the third week but no eggs had appeared in the faeces by this stage. When mice were infected with eggs few larvae reached the alimentary tract and none developed beyond the second stage in the tissues. In dogs over five weeks old infected with eggs, the larvae were distributed to the somatic tissues and did not reach the intestine but in puppies one to three weeks old, which were similarly infected the larvae did develop in the intestine. Mice with second-stage larvae in the tissues were fed to dogs and foxes and in some cases development proceeded in the alimentary tract; in these dogs there was no evidence of somatic migration but in the foxes second-stage larvae were recovered from the lungs. The morphology and development of the second, third and forth-stage larvae is described, illustrated and compared with that in *T. cati*. A host list for *T. canis* is given and the differences in migratory behaviour and possible reasons for these are discussed. S.W.

53—Phytopathology.

a. KRUSBERG, L. R. & NIELSEN, L. W., 1958.—" Pathogenesis of root-knot nematodes to the Porto Rico variety of sweetpotato." **48** (1), 30–39.
b. SMITH, O. F., 1958.—" Reactions of some alfalfa varieties to the stem nematode." **48** (2), 107.

(53a) Sweet-potatoes, variety Porto Rico, were grown in a field heavily infested with *Meloidogyne incognita* var. *acrita* and plants were dug every two weeks in order to study the effects of the nematodes on the roots. Larvae were found to enter mainly at young root tips, at ruptures made by lateral roots or on the surfaces of cracks. After entry the larvae came to rest and fed according to the point of entry in the stele, in the cambial zone or in the parenchyma respectively. The feeding of the nematodes stimulated the formation first of giant cells, followed by abnormal xylem, hyperplastic parenchyma or cork cells. Towards the end of the growing season cork was found around mature females and egg masses, and root cracking was common. Heavily infested young plants were reduced in size and the roots severely cracked. M.T.F.

(53b) Sixteen varieties of lucerne were tested for their reaction to *Ditylenchus dipsaci* in Nevada. Only three, "Lahontan", "Nemastan" and "Nevada Synthetic E" were resistant, all showing less than 10% infestation in the field. Of the rest, "Talent" was 50% infested and the remainder 90% to 100% infested. J.B.G.

54—Plant Disease Reporter.

a. CHRISTIE, J. R. & PERRY, V. G., 1958.—" A low-phytotoxic nematocide of the organic phosphate group." **42** (1), 74–75.
b. BRAUN, A. J., 1958.—" Plant-parasitic nematodes found in association with strawberry roots in the United States." **42** (1), 76–83.
c. SHER, S. A., 1958.—" The effect of nematodes on azaleas." **42** (1), 84–85.
d. WINSTEAD, N. N., WELLS, J. C. & SASSER, J. N., 1958.—" Root-knot control in vegetable crops using D-D and EDB with and without vermiculite as a carrier." **42** (2), 180–183.

e. GOLDEN, A. M. & SHAFER, T., 1958.—" Differential response of *Heterodera schachtii*, the sugar-beet nematode, to selections of *Chenopodium album*." **42** (2), 184–187.
f. GOLDEN, A. M., 1958.—" Influence of leaf diffusate of sugar-beet on emergence of larvae from cysts of the sugar-beet nematode (*Heterodera schachtii*)." **42** (2), 188–193.
g. EPPS, J. M. & CHAMBERS, A. Y., 1958.—" New host records for *Heterodera glycines*; including one host in the Labiatae." **42** (2), 194.
h. TAYLOR, D. P., ANDERSON, R. V. & HAGLUND, W. A., 1958.—" Nematodes associated with Minnesota crops. I. Preliminary survey of nematodes associated with alfalfa, flax, peas, and soybeans." **42** (2), 195–198.
i. LORDELLO, L. G. E. & ZAMITH, A. P. L., 1958.—" A note on nematodes attacking coffee trees in Brazil." **42** (2), 199.
j. PARRIS, G. K., 1958.—" Soil fumigants and their use: a summary." **42** (2), 273–278.
k. CAVENESS, F. E., 1958.—" Two new geographic locations for the sugar beet nematode, *Heterodera schachtii*." **42** (2), 280.
l. SHER, S. A., THOMASON, I. J. & McCASLIN, R. L., 1958.—" Chisel application of methyl bromide for root-knot nematode control." **42** (3), 288–290.
m. HOLLIS, J. P., 1958.—" Specifications for ideal nematocides." **42** (3), 291–307.
n. HOPPER, B. E., 1958.—" Plant-parasitic nematodes in the soils of southern forest nurseries." **42** (3), 308–314.
o. SCHINDLER, A. F., 1958.—" Root-knot nematodes on the mimosa tree, *Albizzia julibrissin*." **42** (3), 315.
p. MORGAN, O. D., 1958.—" Observations on fumigation of tobacco soils." **42** (3), 316–317.
q. LEWIS, G. D., MAI, W. F. & NEWHALL, A. G., 1958.—" Reproduction of various *Meloidogyne* species in onion." **42** (4), 447–448.
r. MAI, W. F., 1958.—" Effectiveness of di-electric heat in killing encysted golden nematode larvae." **42** (4), 449–450.
s. BIRCHFIELD, W. & VAN PELT, H. M., 1958.—" Thermotherapy for nematodes of ornamental plants." **42** (4), 451–455.
t. COURSEN, B. W., ROHDE, R. A. & JENKINS, W. R., 1958.—" Additions to the host lists of the nematodes *Paratylenchus projectus* and *Trichodorus christiei*." **42** (4), 456–460.
u. FORD, H. W. & HANNON, C. I., 1958.—" The burrowing nematode, *Radopholus similis*, in roots of *Crotalaria spectabilis*." **42** (4), 461–463.

(54a) Dichlorophenyl-diethyl-phosphorothioate was found to control populations of plant-parasitic nematodes when applied to the soil as a drench. It was also found to control some soil-inhabiting insects effectively. The chemical was found to have pronounced residual properties and to have little phytotoxic activity. Although this chemical is not as potent a nematicide as some of the halogenated hydrocarbons it is recommended for the control of root-knot and other nematode diseases of trees and shrubs, especially in gardens. H.R.W.

(54b) Examination of root and soil samples from strawberry plantings in 36 States showed that *Pratylenchus*, represented mainly by *P. penetrans*, *P. pratensis* and *P. zeae*, was the most wide-spread plant nematode genus, being especially prevalent in the north-eastern States. *Meloidogyne hapla* was most prevalent in the north central region although almost equally wide-spread in the north-eastern and southern States. In many cases it evidently had been introduced on the planting stock and could probably be controlled by planting root-knot-free material. *Xiphinema americanum*, *Tylenchorhynchus* spp. (mainly *T. claytoni*) and *Helicotylenchus nannus* were most prevalent in the southern region. Species of *Criconemoides*, *Hoplolaimus* and *Trichodorus* were present in some samples but never very numerous. Other stylet-bearing nematodes found were species of *Paratylenchus*, *Tetylenchus*, *Ditylenchus*, *Psilenchus*, *Tylenchus*, *Aphelenchus*, *Aphelenchoides* and various Dorylaimoidea. Root samples provided a more reliable index of *Pratylenchus* distribution and density than did soil samples. *Pratylenchus*, *Meloidogyne* and *Xiphinema* are proved pathogens of strawberry. R.D.W.

(54c) *Ditylenchus* sp., *Trichodorus christei*, *Tylenchus* sp. and *Tylenchorhynchus claytoni* were found associated with chlorotic and stunted azalea plants (*Rhododendron*) in southern California. *T. claytoni* was the only species of the four to cause marked stunting of azalea plants in a green-house test. R.D.W.

(54d) Both the nematicides EDB and D-D were applied to the soil either as a liquid treatment or on vermiculite as a carrier. Experiments showed that effective control of root-knot eelworm was obtained irrespective of method of application. H.R.W.

(54e) Six selections of *Chenopodium album* were tested for susceptibility to the sugar-beet nematode, *Heterodera schachtii*. One selection only (No. 3) produced mature male and female worms, all selections except one (No. 1) produced male worms. Male worms appeared in large numbers on selection No. 5. The results suggest that there is considerable heterogeneity in the plant species *Chenopodium album*. J.J.H.

(54f) Larval emergence from cysts of the sugar-beet eelworm in leaf diffusate of sugar-beet was more than twice that in tap-water but only about half the larval emergence in root diffusate of sugar-beet. H.R.W.

(54g) Hemp sesbania (*Sesbania macrocarpa*), white lupin (*Lupinus albus*), and henbit deadnettle (*Lamium amplexicaule*) were found to be hosts of the soya bean cyst nematode *Heterodera glycines*. *Lamium amplexicaule* is a member of the Labiatae and represents the first record of a host of *H. glycines* outside the Leguminosae. J.J.H.

(54h) The commonest stylet-bearing nematode found around the roots of lucerne, flax, peas, and soya beans was *Xiphinema americanum*. *Tylenchorhynchus* spp. were found in over half the samples. *Helicotylenchus* spp. and *Paratylenchus* spp. were each found in 45% of the samples, and *Pratylenchus* spp. were nearly as frequent. In flax fields *Hoplolaimus coronatus* was common. All species recorded except *Heterodera cacti* are new records for Minnesota. M.T.F.

(54i) *Meloidogyne exigua* is thought to be an important cause of damage to coffee trees in the Ribeirão Prêto area in the State of São Paulo, Brazil, where it has been found attacking decaying trees. It causes small root galls which may easily be overlooked. M.T.F.

(54j) This is a revision of a previous publication. It deals with the nature and action of various soil fumigants, then discusses individually the properties, behaviour and use of chloropicrin, D-D, ethylene dibromide, methyl bromide, Nemagon, Vapam, V-C 13 Nemacide, Terrachlor, Mylone and Telene. A final section indicates changes in concepts of soil fumigation during the last five years. J.B.G.

(54k) The beet eelworm, *Heterodera schachtii* is reported in two new geographical locations, the Imperial Valley of California and Butte County in South Dakota. H.R.W.

(54l) Application of methyl bromide at 150 lb. and 200 lb. per acre gave good control of root-knot nematodes. In order to prevent escape of the fumigant, the soil was either covered with a polyethylene sheet or sealed by rolling and then sprinkling with water. Equally good yields and control of nematodes were obtained with these two methods. H.R.W.

(54m) The rational and empirical approaches to the discovery of nematicides are compared. Hollis concludes that although the rational approach has singularly failed to be productive in this field it is nevertheless a desirable discipline to adopt for the organization, advancement and discovery of scientific knowledge. An attempt has been made to collect all the available knowledge about a restricted area in Louisiana, relevant to the problem of nematicide application. Empirical facts based on field experiments have been collected and placed on a rational basis. With this information at his disposal Hollis attempts to specify the physical properties of the ideal nematicide. Vapour pressure, activity, water solubility, phytotoxicity, mammalian toxicity, residual effects, stability and chemical life in the soil are considered. H.R.W.

(54n) A survey of the occurrence and frequency of plant-parasitic eelworms in forest nurseries showed that *Meloidodera floridensis*, *Tylenchorhynchus claytoni* and an undescribed species of *Tylenchorhynchus* were the only ones directly associated with seedling injury. *Tylenchus* spp. were associated with root rots but were considered to be feeding on the fungi. *Pinus clausa* and *P. nigra* are new host records for *M. floridensis*, *P. palustris* and *P. taeda* for both *M. floridensis* and *Pratylenchus brachyurus*, and *Pinus elliottii* for *T. claytoni* and *T.* sp. (undescribed). Tables set out the data obtained. J.B.G.

(54o) In a green-house test, the roots of *Albizzia julibrissin* were heavily galled by *Meloidogyne arenaria*, moderately galled by *M. arenaria* subsp. *thamesi* and heavily galled, but with no egg masses, by *M. hapla*. No infection resulted from inoculation with *M. incognita*, *M. incognita* var. *acrita* or *M. javanica*, although in the last case there was an unusual degree of root proliferation. M.T.F.

(54p) In a series of tests using D-D, EDB and Nemagon, Morgan showed that granular Nemagon can be used successfully as a replanting fumigant for tobacco-growing soils. The dosage rates of the three nematicides which were found to give some nematode control are given; none of these rates had a phytotoxic effect on the tobacco, but the incidence of Fusarium wilt was reduced. J.J.H.

(54q) Carefully controlled experiments showed that six species of *Meloidogyne* can reproduce for two consecutive generations on onion, *Allium cepa*, causing knotting of the roots. The root-knot species used were *M. arenaria*, *M. arenaria* subsp. *thamesi*, *M. hapla*, *M. incognita*, *M. incognita* var. *acrita* and *M. javanica*. The egg masses formed by *M. hapla* were smaller in both generations than those of the other species. *M. arenaria thamesi* in its second generation produced fewer females and smaller egg masses than the other species. M.T.F.

(54r) Di-electric heat treatment of burlap bags containing potato-root eelworm cysts showed that the temperatures reached (205°F. and 230°F.) killed the eelworm larvae. The cost of equipment required to generate the heat makes the process impractical. J.J.H.

(54s) The most prevalent plant-parasitic nematodes in the chief ornamental nursery area of Florida are *Helicotylenchus multicinctus* and *Meloidogyne incognita*. When exposed to a temperature of 50°C. in water *H. multicinctus* was killed at 2½ minutes and *M. incognita* at four minutes. In bare-rooted plants *M. incognita* was nearly eliminated by 10 minute exposure to a temperature of 50°C. Twenty-four species and varieties of ornamentals, in bundles of 10 with washed roots, were given hot-water treatment for 10 minutes at 50°C. Their survival rate and the galling on tomatoes subsequently grown close to them are recorded. Succulent herbaceous plants in general were the most severely damaged but *Buxus* suffered 40% mortality and *Gardenia* 65%. Some root-knot nematodes survived in seven plant species and none survived in 14 species. M.T.F.

(54t) A list of plants which were found to be hosts of the nematodes *Paratylenchus projectus* and *Trichodorus christiei* is given. The plants tested were grown under green-house conditions in pots which were infested with either of the two nematodes. The nematodes were then recovered from the soil and an estimate made of the decrease or increase in population numbers. This formed the criterion for assessing whether or no a particular plant was a host of the nematode in question. H.R.W.

(54u) High levels of infestation of the roots of *Crotalaria spectabilis* by the burrowing nematode *Radopholus similis* are reported. Although *Crotalaria spectabilis* is not a favourable host it is questioned whether it is, in fact, suitable as a cover crop in any programme which seeks to eradicate the burrowing nematode from the soil. H.R.W.

55—Proceedings of the Helminthological Society of Washington.

a. THOMAS, J. D., 1958.—" Three new digenetic trematodes, *Emoleptalea proteropora* n.sp., (Cephalogonimidae: Cephalogoniminae), *Phyllodistomum symmetrorchis* n.sp., and *Phyllodistomum ghanense* n.sp., (Gorgoderidae: Gorgoderinae) from West African freshwater fishes." **25** (1), 1–8.

b. THOMAS, J. D., 1958.—" Two new digenetic trematodes, *Heterorchis protopteri* n.sp. (Fellodistomidae) and *Acanthostomum bagri* n.sp. (Acanthostomidae: Acanthostominae) from West Africa." **25** (1), 8–14.

c. BOGITSH, B. J., 1958.—" *Tetracotyle lepomensis* n.sp., (Trematoda: Strigeidae) from freshwater fish in Albemarle County, Virginia." **25** (1), 14–16.

d. GOLDEN, A. M., 1958.—" *Dolichodorus similis*, (Dolichodorinae), a new species of plant nematode." **25** (1), 17–20.

e. TARJAN, A. C., 1958.—" A new genus, *Pseudhalenchus* (Tylenchinae: Nematoda), with descriptions of two new species." **25** (1), 20–25.

f. MASSEY, C. L., 1958.—" Four new species of *Parasitylenchus* (Nematoda) from scolytid beetles." **25** (1), 26–30.

g. DALY, E. F., 1958.—" A new dilepidid cestode, *Paruterina reynoldsi*, from the southern crow, *Corvus brachyrhynchos paulus* Howell." **25** (1), 34–36.

h. KUNTZ, R. E., 1958.—" *Schistosoma* sp. in shrews in Lower Egypt." **25** (1), 37–40.

i. DERY, D. W., 1958.—" A description of *Maritreminoides raminellae* n.sp. (Trematoda: Microphallidae)." **25** (1), 40–44.

j. MANTER, H. W. & WALLING, G., 1958.—" A new genus of monogenetic trematode (family Diclidophoridae) from a New Zealand fish." **25** (1), 45–47.

k. DOUVRES, F. W. & LUCKER, J. T., 1958.—" A note on the genera *Nematodirus* Ransom, 1907, and *Nematodirella* Yorke and Maplestone, 1926 (Nematoda: Trichostrongylidae)." **25** (1), 48–52.

l. DOUVRES, F. W. & TROMBA, F. G., 1958.—" Cross transmission of nematodes of domestic animals. II. Infection of a calf with *Hyostrongylus rubidus*, the red stomach worm of swine." **25** (1), 53–54.

m. BECKLUND, W. W., 1958.—" Occurrence of the nematodes *Trichostrongylus longispicularis* and *Ostertagia lyrata* in cattle in Georgia, with notes on characteristics of the specimens." **25** (1), 55–57.

n. RUEHLE, J. L. & CHRISTIE, J. R., 1958.—" Feeding and reproduction of the nematode *Hemicycliophora parvana*." **25** (1), 57–60.

o. COIL, W. H. & KUNTZ, R. E., 1958.—" Records of trematodes collected in Turkey with the descriptions of new species in the families Lecithodendriidae and Plagiorchiidae." **25** (1), 61–67.

p. JELLISON, W. L. & HADLOW, W. J., 1958.—" Parasitic pulmonary granuloma in the Townsend mole." **25** (1), 67–70.

(55a) Thomas describes three new trematode species from fish from rivers in Ghana. *Emoleptalea proteropora* n.sp. from *Clarias senegalensis* is distinguished from the other two species of the genus by its short oval shape, the position of the gonopore which is median and anterior to the oral sucker, and the extension of the cirrus pouch posteriorly to the hind border of the ventral sucker. *Phyllodistomum symmetrorchis* n.sp. from *Auchenoglanis occidentalis* is distinguished from *P. spatula* by the compact testes, and from the other species of *Phyllodistomum* by the position of the ovary clearly in front of the vitelline glands. In *P. ghanense* n.sp. from *Mastacembelus nigromarginatus* the vitelline glands lie between the anterior testis and ovary, the testes are diagonally arranged and only slightly lobed and the ventral sucker is larger than the oral. The 75 species of *Phyllodistomum* previously reported are listed. M.MCK.

(55b) *Heterorchis protopteri* n.sp. from *Protopterus annectens* collected from a lagoon near the Volta estuary is distinguished from *H. crumenifer* by the marginal gonopore, the larger size of the ventral sucker relative to the oral, the nearly equal size of the testes which are pointed posteriorly, the comparatively small eggs (0·025 mm. × 0·0125 mm.) and the location of the receptaculum seminis and transverse vitelline duct, both at mid-ovarian level. *Acanthostomum bagri* n.sp. from *Bagrus docmac* from a tributary of the Volta has only 19 circumoral spines. The pharynx measures 0·16–0·19 mm. × 0·10–0·17 mm. and is appreciably larger than the ventral sucker which measures 0·11–0·13 mm. × 0·14–0·16 mm. Twenty-one species included in *Acanthostomum*, other than *A. bagri*, are listed. M.MCK.

(55c) Cysts containing larvae of *Tetracotyle lepomensis* n.sp. were found in grape-like clusters in the body-cavities of *Lepomis gibbosus* and *L. m. macrochirus* from the State of Virginia.

The new species differs from the *Tetracotyle* species reported from fish in that the hind-body is clearly defined and there is a well developed suctorial pocket. Of the *Tetracotyle* species reported from hosts other than fish, *T. lepomensis* most closely resembles *T. serpentis* and *T. pipientis* but is distinguished chiefly by the well defined hind-body. M.McK.

(55d) *Dolichodorus similis* n.sp. is described and figured. It is characterized by its shorter spear (about 80 μ long), by the more posterior position of the excretory pore and by the female tail which has a longer point than has *D. heterocephalus*. It occurred around the roots of *Sparganium greenei* on the edge of the Pajaro river in California. J.B.G.

(55e) *Pseudhalenchus* n.g. differs from *Halenchus* by the presence of a median bulb with valves, the absence of a hooked tail and in being terrestrial. From *Tylenchus* it differs in that the oesophageal glands are contained in a long lobe overlapping the intestine. *P. minutus* n.sp. (type species) and *P. anchilisposamus* n.sp. are described and figured. The former is about 412 μ long, with moderate annulation, four incisures on the lateral field and has a short post-vulval sac. The latter is longer, about 624 μ in length, with indistinct annulation, six incisures and a longer post-vulval sac. The former was found in soil of a citrus grove in Florida, the latter around grass roots in California and also in Florida and Utah. J.B.G.

(55f) Described and figured are: *Parasitylenchus elongatus* n.sp. parasitic in *Scolytus ventralis* from Sandia mountains, Albuquerque, New Mexico, characterized by the broadly rounded lip region, obtuse tail, greater length and width than other species; *P. pilifronus* n.sp. in *Ips pilifrons* from Uncompahgre National Forest, Norwood, Colorado, characterized by its translucent cuticle, and the "crazy paving" arrangement of its hypodermal cells; *P. avulsi* n.sp. in *Ips avulsus* from Talladega National Forest, Alabama, characterized by its crown-like lip region, differing from *P. scolyti* in its greater size and shape of terminus and from *P. cossoni* in the shape of the lip region and subterminal position of the vulva; *P. ovarius* n.sp. in *Ips pilifrons* from Uncompahgre National Forest, differing from *P. dispar* by its greater size and terminal anus, and from *P. grossmannae* by the presence of an anus and narrower, rounded lip region. In no case are males described. J.B.G.

(55g) *Paruterina reynoldsi* n.sp. from *Corvus brachyrhynchos paulus* from the State of Virginia resembles *P. chlorurae* and *P. morgani* but differs chiefly in having 44 to 48 rostellar hooks, 21 μ and 33 μ long, and 12 to 14 testes. Daly gives the 19 species now contained in *Paruterina*. M.McK.

(55h) Nearly mature specimens of *Schistosoma* sp. apparently representative of the *S. mansoni* complex in lower mammals were found in seven *Crocidura olivieri* from Lower Egypt. The life-cycle was not observed nor were mature eggs seen, but the body size (2,971 μ–3,677 μ in the male and 2,890 μ–5,183 μ in the female) and appearance were sufficiently different from *S. mansoni* in a comparable stage of maturity to warrant a new description. The cuticle was smooth except for fine circular striations and areas with the body well crenate, perhaps due to fixation. In the males there were lateral and interior expansions or pouches on the caeca near the gut bifurcation, and in some specimens, a transverse commissure at the level of the acetabulum. M.McK.

(55i) *Maritreminoides raminellae* n.sp., from seven *Mergus serrator* from Connecticut, differs from *Maritreminoides ammospizae* in that the cirrus pouch is wider at its poral end, the prostate glands are much more developed, the uterus passes anteriorly to the cirrus, the body is longer and narrower (0·75–0·99 mm. × 0·20–0·23 mm.) while the suckers, testes and ovary are smaller. Dery stresses that the study of microphallids requires accurate observation of the cirrus which, if not everted, must be made from histological sections. He rejects the suppression by Etges (1953) of *Gynaecotyla* as a synonym of *Microphalloides*. M.McK.

(55j) *Eurysorchis australis* n.g., n.sp., found on *Seriolella brama* from New Zealand, is similar to *Echinopelma* but most of the testes are located in the haptor. It is unique among the Diclidophoridae in possessing a spined atrium, which structure has a ring of 20 to 22 hooks

The organ described as a vagina in *Echinopelma* was clearly a vitello-intestinal canal in the new genus and appeared to be such in the holotype and sectioned paratype of *Echinopelma bermudae* which were re-examined. M.McK.

(55k) As both sexes of the genotype of *Nematodirus* were observed to have a peri-oral crown of denticles, as described for *Nematodirella*, this character no longer separates the two genera. The genotypes of *Nematodirus* (*N. filicollis*) and *Nematodirella* (*N. longispiculata*) can however be distinguished by the presence of one functional female genital tube and an anterior vulva in *Nematodirella* and two functional female tubes and a posterior vulva in *Nematodirus*. As a result of the examination of specimens in the light of these criteria the new combination *Nematodirella dromedarii* is proposed. *Nematodirus tarandi* was found to be correctly allocated generically. The cephalic structure of the type species of *Nematodirella* and several species of *Nematodirus* was found to consist of 14 papillae and two amphids (not six papillae as stated by several authors) outside the crown of denticles and four submedian cuticular structures of slightly crescentic shape, located apparently within the cephalic inflation. M.McK.

(55l) A calf was given approximately equal numbers of infective larvae of the swine nematodes *Hyostrongylus rubidus* and *Oesophagostomum longicaudum*. It was passing eggs of *H. rubidus* on the 24th day. 25,280 adults of this species, all of which were apparently mature, were found at autopsy on the 28th day. No *O. longicaudum* were found and there was no gross pathological evidence of their presence in the large intestine. M.McK.

(55m) *Trichostrongylus longispicularis* and *Ostertagia lyrata*, which have only rarely been recorded from cattle in the U.S.A., are reported for the first time from Georgia. Both species were present in animals suffering from clinical parasitism. About fifty males of *T. longispicularis* were measured and the lengths of the body, spicules and gubernaculum were generally smaller than those given in Sommerville's data (1956). One to 10,000 *O. lyrata* were recovered per animal. Their measurements somewhat exceeded those generally reported for the species. *O. lyrata* has possibly been overlooked in cattle in the U.S.A. because it usually occurs with large numbers of *O. ostertagi*. M.McK.

(55n) Experiments designed to test the feeding habits of *Hemicycliophora parvana* on the roots of *Zea mays*, *Phaseolus vulgaris* and *Indigofera hirsuta* in pots and in the field either where the soil was undisturbed or after fumigation, are described. The nematode fed on the roots, just behind the root tips, of the first two plants named but not on the last. No necrotic lesions were formed. The writers suggest that experiments on plants grown in soil inoculated with the particular nematode under consideration only, are likely to yield more reliable information of the reproductive capacity of the nematode, than when conducted in the undisturbed soil. J.B.G.

(55o) Three new species of trematodes, seven known species and two which are identified only to generic level are reported from Turkey. In *Macyella turkensis* n.sp., from *Sterna vulgaris* and *Turdus merula*, the body is slightly more than half as long as in *M. postgonoporus* and measures 0·58 mm.–0·68 mm. and both suckers are smaller. *Acanthatrium sogandaresi* n.sp. from *Plecotus auritus* is distinguished from other species of the genus which lack an oesophagus, or have only a short one, by the peculiar shape of the oral sucker, which is illustrated, and by the short length of the atrial spines. *Auridistomum pellucida* n.sp. from *Clemmys caspica rivulata* appears to be most similar to *A. thomasi* but can be differentiated by the presence of vitellaria as far forwards as the caecal bifurcation. M.McK.

(55p) Granulomata which were interpreted as lesions that had formed around larvae of an unidentified nematode were found in the lungs of *Scapanus townsendi* in the States of Washington and Oregon. Several lungs had nodules containing larvae. The lesions varied from scattered and indistinct foci to abundant white nodules visible over about half of the lung surface. On one occasion adult nematodes were found in transverse sections of a large pulmonary vein. The article is illustrated by four photomicrographs. M.McK.

56—Proceedings of the Linnean Society of London.

a. PETERS, B. G., 1958.—" Symposium on plant parasitic Nematoda." **169** (1/2), 84–85.
b. HAGUE, N. G. & HESLING, J. J., 1958.—" Population studies on cyst-forming nematodes of the genus *Heterodera*." **169** (1/2), 86–92.
c. WILLIAMS, T. D., 1958.—" Potatoes resistant to root eelworm." **169** (1/2), 93–104.
d. PITCHER, R. S. & CROSSE, J. E., 1958.—" On a disease complex of strawberries involving a nematode and a bacterium." **169** (1/2), 105.

(56b) The rate of increase of *Heterodera rostochiensis* and *H. major* decreases the higher the initial population. Under given conditions a certain initial population will produce the maximum final population. If the initial population is increased further the final population decreases. Relatively more large cysts are produced from low inocula, and the mean egg content of new cysts therefore appears to fall with increase of inoculum. From similar inocula of *H. major* relatively more large cysts are produced on barley than on oats. J.J.H.

(56c) With the exception of that from *Solanum vernei*, root diffusate from lines of potatoes used in breeding for eelworm resistance possesses hatch-stimulating property when applied to cysts of the potato-root eelworm. In *S. andigenum* very few female eelworms develop, although males appear to reach maturity. In *S. vernei* the degree of resistance to larval invasion and development is higher than in *S. andigenum*. Field trials of resistant lines of *S. andigenum* × *S. tuberosum* showed that the eelworm population had fallen; similar results were shown by pot trials. Yield of resistant potatoes is adversely affected by high eelworm population levels, and giant cells are found in the plant roots. J.J.H.

57—Revista Brasileira de Biologia.

a. LORDELLO, L. G. E., 1958.—" Parasitismo de *Aphelenchus avenae* em raízes de cantalupe (Nematoda, Aphelenchidae)." **18** (1), 33–36. [English summary p. 35.]
b. HUBENDICK, B., 1958.—" A note on the taxonomy of the Brazilian vector snails of *Schistosoma mansoni*." **18** (1), 37–40.
c. ZAGO FILHO, H., 1958.—" Contribuição para o conhecimento de hospedeiros intermediários e definitivos da *Turgida turgida* (Rud., 1819) Travassos, 1920 (Nematoda, Spiruroidea)." **18** (1), 41–46.
d. TRAVASSOS, L. & KLOSS, G. R., 1958.—" Contribuição ao conhecimento dos nematódeos de coleópteros Passalidae." **18** (1), 55–57.
e. LOBATO PARAENSE, W., 1958.—" The genera *Australorbis*, *Tropicorbis*, *Biomphalaria*, *Platytaphius* and *Taphius* (Pulmonata, Planorbidae)." **18** (1), 65–80.
f. LOBATO PARAENSE, W. & DESLANDES, N., 1958.—" Observations on *Taphius havanensis* (Pulmonata, Planorbidae)." **18** (1), 87–91.

(57a) Lordello found an adult female and eggs of *Aphelenchus avenae* in tissues of cantaloupe roots. He says these investigations prove that *A. avenae* is not a harmless form. He rejects the synonomy of *A. avenae* and *A. solani* (Steiner, 1935) n.comb. synonym *Aphelenchoides solani* Steiner, 1935 [but presents no evidence in support of his assertion]. J.B.G.

(57b) Hubendick discusses some of the taxonomic problems concerning the Brazilian planorbid snails which act as intermediate hosts for *Schistosoma mansoni*. He again stresses the fact that all the hosts for *S. mansoni* larvae are congeneric and that although *Taphius* has priority as the oldest available name it is undesirable to adopt this usage until the International Commission on Zoological Nomenclature has given a decision on the subject. The evolution of fresh-water animals is discussed and the possibility of using resistant strains of host species to replace susceptible forms is mentioned as a possible means of control. C.W.

(57c) Zago has carried out experimental life-cycle studies using various intermediate and definitive hosts for *Turgida turgida*. He reports that the most successful intermediate hosts were *Miogryllus verticallis* and *Gryllulus assimilis*. Other crickets and cockroaches were susceptible to infection in lesser degree while various beetles and flies remained uninfected. *Lutreolina crassicaudata*, cats, dogs, rats, mice and guinea-pigs were used as definitive hosts but the infection only became established in the last three and even in these the third-stage larvae did not develop further and were finally eliminated. C.W.

(57d) Travassos & Kloss describe a new nematode, *Ventelia obesa* n.g., n.sp., from the intestine of the beetle *Veturius cephalotes* from two localities in the State of São Paulo, Brazil. No male specimens were available and the description is therefore based on females only. C.W.

(57e) Paraense redescribes the anatomy of the type species of *Australorbis*, *Tropicorbis*, *Taphius* and *Platytaphius* and shows that all of these genera are indistinguishable from *Biomphalaria*. A complete argument, based on the International Rules of Zoological Nomenclature, for the adoption of *Taphius* as the generic name of this group, is presented. It is suggested that the genus is of South American origin and that the African forms have been introduced from the New World. C.W.

(57f) Paraense & Deslandes describe the anatomy of topotype material of *Tropicorbis havanensis* and, on the basis of their observations, they conclude that the species is indistinguishable from the Mexican *T. maya* and *T. liebmanni* both of which now fall into the synonymy of *T. havanensis*. This species is now transferred to the genus *Taphius* in accordance with the conclusions reached by the senior author in another paper [see preceding abstract]. C.W.

58—Revista Ibérica de Parasitología.

a. DÍAZ-UNGRÍA, C. & JORDANO, D., 1958.—" Cestodos de Venezuela. III. *Dilepis pifanoi* nov.sp. (Cestoda Dilepididae), parásita del *Nyctibius griseus* (Aves: Caprimulgi)." **18** (1), 3–12. [English summary p. 7.]

b. LÓPEZ-NEYRA, C. R., 1958.—" Sobre unos vermes parásitos obtenidos en el *Ziphius cavirostris* Cuvier (Cetáceo; Denticeto) varado en Almería, en especial de *Crassicauda giliakiana* (Spiruroidea; Tetrameridae)." **18** (1), 13–18.

c. GONZÁLEZ CASTRO, J., RUIZ DEL RINCÓN, E. C. & RODRÍGUEZ GARCÍA, F., 1958.—" Nuevo aparato de agitación mecánica para las pruebas de floculación sobre porta." **18** (1), 51–54.

d. LÓPEZ-NEYRA, C. R., 1958.—" Evolución uterina de la *Taenia porosa* Rudolphi 1810, reafirmando la invalidez del género *Paricterotaenia* Fuhrmann 1932. (Comentarios al trabajo del Dr. Bona, 1957)." **18** (1), 55–57.

e. GONZÁLEZ CASTRO, J., RUIZ DEL RINCÓN, E. C. & RODRÍGUEZ GARCÍA, F., 1958.—" Estudio sobre la infestación natural prenatal con *Toxocara canis* (Werner 1782) Johnston 1916. Aportación de varios casos." **18** (2), 89–105. [English summary p. 104.]

f. MONTEOLIVA HERNÁNDEZ, M. & GUEVARA POZO, D., 1958.—" Lio y desmoglucógeno en *Ascaridia galli*." **18** (2), 107–115. [English summary p. 114.]

g. GONZÁLEZ CASTRO, J. & RUIZ DEL RINCÓN, E. C., 1958.—" Transmisión de inmunicuerpos de la madre a los hijos en conejas inmunizadas con líquido celómico de *Ascaris suum*." **18** (2), 117–128. [English summary p. 128.]

h. RUIZ DEL RINCÓN, E. C. & GONZÁLEZ CASTRO, J., 1958.—" Transmisión de anticuerpos ascaridianos de la madre al feto en la especie humana." **18** (2), 129–139. [English summary p. 138.]

i. GONZÁLEZ CASTRO, J. & RUIZ DEL RINCÓN, E. C., 1958.—" Influencia de los estrógenos, progesterona, pituitrina, ACTH y cortisona, sobre la concentración de anticuerpos ascaridianos en sangre." **18** (2), 141–166. [English summary p. 164.]

j. GONZÁLEZ CASTRO, J. & MARTOS GUTIÉRREZ, M., 1958.—" Eficiencia comparativa de los métodos de Watson y de Otto, Hewitt y Strahan para concentrar huevos de *Ascaris lumbricoides* y *Trichuris trichiura*." **18** (2), 167–179. [English summary p. 178.]

(58a) In *Dilepis pifanoi* n.sp. from *Nyctibius griseus*, in Venezuela, the scolex is 0·461 mm. long × 0·582 mm. wide and has two crowns of 16 hooks each. There are $37 \pm 1{\cdot}5$ testes per proglottis, the ovary is bilobate and the posterior lobe is level with the yolk gland. The ellipsoidal eggs measure $57{\cdot}2 \pm 1\,\mu \times 41{\cdot}3 \pm 1\,\mu$. M.MCK.

(58b) From *Hyperoodon* (*Ziphius*) *cavirostris*, stranded off Almeria, Spain, López-Neyra records *Crassicauda giliakiana*, *Anisakis physeteris* and *A. typica*. The last two [and apparently the first species also] are recorded for the first time from this host and the Iberian Peninsula. The differential characters and hosts of the eight species of *Crassicauda* are summarized. A table is given of some of the measurements of the two species, *C. giliakiana* and *C. crassicauda*, known to have spicules. M.MCK.

(58c) González Castro *et al.* describe an electrically driven apparatus for agitating sera in the performance of flocculation tests in cases of trichinous or ascarid infections. It imparts a uniform circular motion of 1 cm. diameter and one revolution per second. The diameter and speed of revolution can be altered if required. M.MCK.

(58d) Although Bona has denied that uterine capsules develop in *Taenia porosa* [for abstract see Helm. Abs., **26,** No. 289a], López-Neyra considers that Bona's description of the uterine and egg development implies that capsules do form. López-Neyra reiterates his views [for abstract see Helm. Abs., **20,** No. 552a] that *Taenia porosa* develops uterine capsules, and that it is therefore a member of *Choanotaenia*. Hence *Paricterotaenia*, of which *T. porosa* was type, becomes a synonym of *Choanotaenia*. M.MCK.

(58e) The present report of *Toxocara canis* in puppies from the neighbourhood of Granada is the first record of prenatal infection with this parasite in Spain. Of the eight infected puppies, which were from three litters reared hygienically away from the mother, one was 58 days old and the remainder were six to 14 days old. M.MCK.

(58f) Whereas lyo-glycogen (free glycogen) was found to be abundant in dried *Ascaridia galli*, desmo-glycogen (fixed glycogen bound with proteins) was present in smaller amount. After hydrolysis of free glycogen, glucose and a minute quantity of mannose were detected but fixed glycogen appeared to contain glucose only. In *A. galli* maintained in a non-nutrient medium, the free glycogen decreased in quantity more quickly than fixed glycogen while the levels of free glucose appeared to remain relatively constant. M.MCK.

(58g) Two rabbits were immunized during pregnancy with the body fluid of *Ascaris lumbricoides* of the pig. All their young, including two examined immediately after birth, contained Ascaris antibodies in the blood. The titres of antibodies in the milk in the stomach of four young were the same as in their blood and had increased from the third to the sixth days. These experiments indicated that antibodies were passed from the mother to the young through the placenta and via the milk, this last route being as important, if not more important, than the placental route. In the mothers the titres of antibody reached a maximum in the blood on the 12th and 20th days after parturition and thereafter remained constant; in the young, the titres in the blood reached a peak on the 9th and 12th days and then fell to low levels by the 20th day. M.MCK.

(58h) The peripheral blood of six out of nine pregnant women was positive for ascarid antibodies at parturition but the umbilical blood was positive only in the babies of the two mothers with the highest peripheral titres. Four to six days later the titres had risen in all of the positive mothers, two more had also become positive, and antibodies were found in the milk of the two with the highest titres. Their babies were still the only ones that were positive, the titres in the babies' blood having increased by a factor of four since birth. It was concluded that in women as in rabbits, both of which have haemochorial placentation, ascarid antibodies pass to the young through the placenta and later via the milk. This last route is apparently the more effective. It seems that higher titres are necessary in the blood of women than of rabbits before antibodies pass from the mother to the child. M.MCK.

(58i) To determine whether the increase or appearance of Ascaris antibodies in the blood of pregnant women and rabbits after parturition is associated with hormone factors, González & Ruiz gave injections of oestrogen, progesterone, pituitrin, ACTH and cortisone to eight rabbits which had been immunized with the body fluid of *Ascaris lumbricoides* from the pig or infected with the parasite. These rabbits had passed the peak of antibody concentration at the time of experiment. Progesterone and pituitrin did not affect the concentration of antibodies but oestrogen (1 mg. given alone or 4 mg. with progesterone) produced a marked though transitory lessening of the antibody concentration. ACTH (25 I.U.) caused the appearance of antibodies in one rabbit which was negative at the time of experiment. The remaining test rabbits were positive at the time of experiment and ACTH (25 I.U.) and cortisone (250 mg.) each produced a marked increase in antibodies which persisted for a period of up to 108 hours. M.MCK.

(58j) The modifications made by Watson (1947) and by Otto, Hewitt & Strahan (1941) of the zinc sulphate flotation technique were each applied to 20 samples of human faeces containing eggs of *Ascaris lumbricoides* and *Trichuris trichiura*. The efficacies were compared on the basis of egg counts. (When Watson's technique was used the final centrifuge was omitted and, instead, the cover slip was applied to the mouth of the tube for a few minutes.) There was no significant difference between the efficacies of the two techniques. Unfertilized Ascaris eggs were not satisfactorily concentrated and were best sought by direct faecal examination. M.MCK.

59—Revista Latinoamericana de Microbiología. Mexico.

a. BIAGI F., F., TAY, J. & PORTILLA, J., 1958.—"Valor de una intradermo-reacción y una reacción de precipitación en el diagnóstico de la fasciolosis humana." **1** (1), 69–78. [English summary p. 77.]

b. CABALLERO Y C., E. & BARRERA, A., 1958.—"Estudios helmintológicos de la región oncocercosa de México y de la República de Guatemala. Nematoda, 11a. Parte. Filarioidea. V. Hallazgo de un nódulo oncocercoso en un mono araña, *Ateles geoffroyi vellerosus* Gray, del Estado de Chiapas." **1** (1), 79–94. [English summary pp. 88–89.]

(59a) In Atlixco, Puebla, an endemic focus of fascioliasis in Mexico, 27·7% of 1,468 persons selected at random were positive to the intradermal test with *Fasciola hepatica* antigen and 4% of 354 were positive to the precipitin test. Among several hundred medical students in the city of Mexico 14·3% reacted to the skin test and 1·4% were positive to the precipitin test. *F. hepatica* eggs were found in the faeces of five of 252 persons who had a positive skin reaction. In seven persons harbouring Fasciola the infection was confirmed in all seven by the intradermal test and in six by the precipitin test. No consistently positive precipitin reactions were obtained with the antigen when other helminth infections were involved. Biagi *et al.* conclude that a positive precipitin reaction at titres above 1:5,000 indicates infection with Fasciola. The intradermal test would be useful in epidemiological surveys to select people in whom Fasciola infection might be sought by other means. M.MCK.

(59b) Caballero & Barrera describe from *Ateles geoffroyi vellerosus* a nodule containing adult *Onchocerca*. This genus has not apparently been reported before from a monkey. The morphology of numerous fragments of a female, including a tail, and of microfilariae in the connective tissue of the nodule suggested that the species was *O. volvulus*. The identification was further supported by the fact that the finding was in the Mexican state of Chiapas where *O. volvulus*, the endemic species in man, forms nodules but *O. lienalis* in cattle and *O. reticulata* in horses do not. M.MCK.

60—Rivista di Parassitologia.

a. ROSSI-ESPAGNET, A. & CAPONE, M., 1958.—"Considerazioni sulla frequenza delle parassitosi intestinali in base all'esame coprologico di 6,000 individui osservati presso la Clinica Medica di Roma dal 1947 al 1956." **19** (1), 47–58. [English summary p. 58.]

b. LAGRANGE, E., 1958.—"Infections unisexuées et possibilité de guérison de bilharziose à *S. mansoni* chez la souris." **19** (1), 59–66. [English & Italian summaries p. 66.]

(60a) Examination of faeces from 6,057 individuals from the city and province of Rome and other parts of south and central Italy, between 1947 and 1956, showed the presence of *Taenia saginata* in 33, *Hymenolepis nana* in 13, *Ascaris lumbricoides* in 292, *Enterobius vermicularis* in 22, *Strongyloides stercoralis* in 12, *Ancylostoma duodenale* in 74 and *Trichuris trichiura* in 262. M.MCK.

(60b) The exposure of mice to cercariae of *Schistosoma mansoni* from single planorbids gave rise to (i) unisexual infections, (ii) normal bisexual infections, (iii) bisexual infections, the eggs of which did not hatch, and (iv) abnormal worms, viz., intersexes, females with a rudimentary or imperfect gynaecophoric canal and males without testes. Two mice lost their infections spontaneously. M.MCK.

61—Scottish Agriculture.

a. MacLAGAN, D. S., 1958.—" Pest control in cereal crops." **37** (3), 158–161.
b. SHARMAN, G. A. M., 1958.—" Liver flukes." **37** (4), 203–205.
c. GRAINGER, J., 1958.—" The field control of potato root eelworm." **37** (4), 223–224.

(61a) The stem eelworm *Ditylenchus dipsaci* is included in this paper describing insect and other pests of cereals. The writer recommends weed suppression, the use of the resistant oat variety Milford and a gap of three years between oat crops as methods of obviating crop damage. J.J.H.

(61b) Sharman cites statistics from Inverness showing that in 11·5% of the 1,412 cattle and 1% of the 7,722 sheep slaughtered there between August and November 1957 the livers were condemned, mostly for fluke damage, at an estimated cost of £500. Although the situation has been improving in recent years owing to dosing and drainage, these incidences suggest that the disease in cattle is not receiving sufficient attention and that they may be responsible for perpetuating the infection both in sheep and cattle. R.T.L.

62—South African Medical Journal.

a. BEAVER, P. C., 1958.—" Human disease from common worms of dogs and cats." **32** (2), 42–45.
b. ELSDON-DEW, R. & HORNER, R., 1958.—" The incidence of intestinal parasites in Durban factory workers." **32** (6), 145–146.
c. MARKS, C., 1958.—" The surgical pathology of bilharziasis." **32** (6), 162–166.

(62a) Beaver surveys the known facts relating to cutaneous and visceral larva migrans and to Loeffler's syndrome produced by the migration in human tissues without further development of the larvae of nematodes parasitic as adults in dogs and cats. He stresses that the cryptic tendency of visceral larva migrans infections tends to cause them to be overlooked as an aetiological factor, and that the accompanying sustained high eosinophilia may lead to confusion in diagnosis. J.M.W.

(62b) Elsdon-Dew & Horner investigated the incidence of intestinal parasites in a group of African factory workers by the direct and zinc sulphate flotation examination of a single stool specimen from each individual. The incidence of helminthic infections was markedly lower than in a group of slum-dwellers surveyed previously but higher than in a previously-surveyed group of housing scheme residents. The following infection rates were observed: *Trichuris trichiura* 43·5%; hookworm 6·7%; *Ascaris lumbricoides* 37·1%; *Schistosoma* spp. 0·9%; *Hymenolepis* spp. 0·3%; *Taenia* spp. 11·1%. J.M.W.

63—Transactions of the American Microscopical Society.

a. SINGH, K. S., 1958.—" On the development of the excretory system in the larval stages of *Gigantocotyle explanatum* (Creplin, 1847)." **77** (2), 89–96.

(63a) Singh has studied the excretory system of the miracidium, sporocyst, redia and cercaria of *Gigantocotyle explanatum*. In the miracidium and sporocyst there is one pair of flame cells and excretory ducts which open separately to the exterior. In the redia there are three pairs of flame cells with ducts which join to form a common excretory duct; this runs into an excretory bladder which is comparatively wide and discharges to the exterior through an excretory pore. In the young cercaria there is a single pair of flame cells and ducts from which a second pair of flame cells develops. After this stage the exact branching of the smaller ducts and development of flame cells could not be followed accurately owing to the appearance of the cystogenous cells but as much as could be observed is described and illustrated. Singh's observations confirm Hussey's view that the dorsal excretory pore is formed by the breaking of the tissue of the tail and the duct and details of this process are given. S.W.

64—Transactions of the Royal Society of Tropical Medicine and Hygiene.

a. BUCKLEY, J. J. C. & YEH, L. S., 1958.—"*Euparadistomum* sp. from the liver of a domestic cat from Pate Island, Kenya." [Demonstration.] **52** (1), 11.
b. YEH, L. S., 1958.—"The differentiation of *Setaria cervi* and *S. digitata*, the two species commonly found in ruminants in Asia." [Demonstration.] **52** (1), 11.
c. YEH, L. S. & JORDAN, P., 1958.—"A new gordiid worm, parasitic in man." [Demonstration.] **52** (1), 11.
d. YEH, L. S., SYMES, C. B. & MATAIKA, J. U., 1958.—"A peculiar undescribed filarial worm from the fruit bat in Fiji." [Demonstration.] **52** (1), 11.
e. ANDERSON, R. C., 1958.—"The Diplotriaeninae, filarioid parasites of the air sacs of birds, their morphology and life cycles." [Demonstration.] **52** (1), 12.
f. LOTHE, D. F., 1958.—"An immature *Oesophagostomum* sp. from an umbilical swelling in an African child." [Demonstration.] **52** (1), 12.
g. LEROUX, P. L., 1958.—"The validity of *Schistosoma capense* (Harley, 1864) amended as a species." [Demonstration.] **52** (1), 12–14.
h. LEROUX, P. L., 1958.—"Infestation with ova morphologically resembling *Schistosoma haematobium* in man in India." [Demonstration.] **52** (1), 14.

(64a) The domestic cat is recorded as a new host for *Euparadistomum* sp. R.T.L.

(64b) Yeh confirms that *Setaria cervi* and *S. digitata* are morphologically distinct species although in Asia they are commonly present together in ruminants. As von Linstow originally pointed out, the tail of the female of *S. cervi* ends in one or two circles of spikes while that of *S. digitata* has a large rounded terminal knob. R.T.L.

(64c) *Pseudogordius tanganyikae* was passed by a five-year-old girl in East Africa. [This has already been recorded as *P. tanganyikae* n.g., n.sp. For abstract see Helm. Abs., **26**, No. 180e.] R.T.L.

(64d) This undescribed filarial worm is the first record of the presence of a nematode in the fruit bat, *Pteropus hawaiiensis*, from Fiji. Details of the adult from the peritoneum and of the microfilariae from the peripheral blood will be described later. R.T.L.

(64e) The Diplotriaeninae which inhabit the air sacs of birds produce thick-shelled eggs containing differentiated larvae which pass through the lungs, up the trachea and are evacuated in the faeces. The larval development of *Diplotriaenoides translucidus*, known to develop in grasshoppers, was demonstrated. R.T.L.

(64f) An immature specimen, probably of *Oesophagostomum* (*Ihleia*) *stephanostomum*, removed from a swelling just above the umbilicus of an African child in Uganda, is a new record of the occurrence of this parasite in man in Africa. R.T.L.

(64g) *Schistosoma capense* (Harley, 1864) was based on two kinds of eggs from human urine in South Africa. One was considered by Blackie to be that of *S. mattheei*. For the other the name *S. capense* is now retained as that of the common causal parasite of urinary schistosomiasis in South Africa. *Afrobilharzia* n.g. is created for *S. mansoni* and *S. rodhaini*. *S. japonicum* is transferred to *Sinobilharzia* n.g. [preoccupied by *Sinobilharzia* Dutt & Srivastava, 1955]. *Bilharzia margrebowiei* is made type of *Rhodobilharzia* n.g. *S. bomfordi* is removed from *Ornithobilharzia* and made type of *Eurobilharzia* n.g. while *Ornithobilharzia nairi* is transferred to *Bivitellobilharzia* as a new combination. The genus *Schistosoma* is now restricted to *S. haematobium*, *S. capense*, *S. indicum*, *S. bovis*, *S. mattheei*, *S. intercalatum*, *S. curassoni* and *S. leiperi*. The generic status of *Schistosoma spindale*, *S. nasalis*, *S. incognitum*, *S. suis* and *S. haematobium* from man in Bombay State, is still *sub judice*. R.T.L.

(64h) LeRoux is of opinion that the schistosome eggs figured by Dr. Leila Dhanda in *J. Indian med. Assoc.*, 1956, 407–408 [for abstract see Helm. Abs., **25**, No. 242a] as recovered from the faeces of four Indian patients must have resulted from the ingestion of tissues of animals infected with *Schistosoma indicum*. R.T.L.

64—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

i. LEROUX, P. L., 1958.—"*Pharyngostomum cordatum* (Dies., 1850), *Galoncus perniciosus* (v. Linstow, 1885) and *Gnathostoma spinigerum* Owen, 1836, infections in a lion in Northern Rhodesia." [Demonstration.] **52** (1), 14.

j. LEROUX, P. L., 1958.—"Life-cycle of *Gastrodiscus aegyptiacus* (Cobbold, 1876)." [Demonstration.] **52** (1), 14–15.

k. LEROUX, P. L., 1958.—"Bone tuberculosis in the red lechwe (*Adonota leche*) in Northern Rhodesia." [Demonstration.] **52** (1), 15.

l. NEWSOME, J., 1958.—"Demonstration of the relationship of schistosomal pigment to *Schistosoma mansoni* eggs in the liver." [Demonstration.] **52** (1), 23.

m. NEWSOME, J. & ROBINSON, D. L. H., 1958.—"The M.R.C. Bilharzia Research Group, film: Normal behaviour of *Schistosoma mansoni*." [Demonstration.] **52** (1), 23–24.

n. ROBINSON, D. L. H., 1958.—"Demonstration of egg laying by *Schistosoma mansoni* in vitro." [Demonstration.] **52** (1), 24.

o. EDESON, J. F. B. & WHARTON, R. H., 1958.—"The experimental transmission of *Wuchereria malayi* from man to various animals in Malaya." **52** (1), 25–38. [Discussion pp. 39–45.]

p. ADAMS, A. R. D., 1958.—"Symposium on onchocerciasis. I. Introduction." **52** (2), 95–96.

(64i) In Northern Rhodesia leRoux collected from an old lion, *Ancylostoma paraduodenale*, *A. tubaeforme*, *Dirofilaria acutiuscula*, *Galoncus perniciosus*, *Gnathostoma spinigerum*, *Ollulanus tricuspis*, *Physaloptera praeputialis*, *Toxascaris leonina*, *Pharyngostomum cordatum*, *Dipylidium* sp. and *Mesocestoides* sp. Several partly digested *Rictularia*, evidently from ingested rodents, were present in the small intestine. R.T.L.

(64j) Several species of fresh-water snails from regions of Africa where *Gastrodiscus aegyptiacus* is endemic were submitted to experimental infection. Only *Bulinus* (*B.*) *forskali* and *B.* (*B.*) *senegalensis* proved susceptible, yielding many cercariae which encysted on partly submerged grass or floated on the surface. A sudden drop in temperature caused the miracidia to become very active within the egg-shell. LeRoux suggests that the eggs develop on damp pastures and only hatch when it rains or when carried into near-by collections of water on the feet of animals. The rediae and cercariae are almost identical with *Cercaria fraseri* found in *Indoplanorbis exustus* in Assam which may be the intermediate host of *Gastrodiscoides hominis*. R.T.L.

(64k) Red lechwe *Adenota leche* near Monze in Northern Rhodesia were found to be very heavily parasitized with *Dictyocaulus* sp., *Schistosoma mattheei*, *S. leiperi*, *Rhodobilharzia margrebowiei*, *Onchocerca* sp., *Setaria* sp. and several species of gastro-intestinal helminths including paramphistomids and *Bunostomum cobis*. R.T.L.

(64l) Very small balls of tissue sieved from the liver of *Mastomys coucha* infected with *Schistosoma mansoni* consisted of single eggs surrounded by cellular reaction and with pigment closely applied to dying or dead eggs. There was little reaction and no pigment around eggs from different parts of the gut. R.T.L.

(64n) Robinson demonstrated a glass apparatus in which *Schistosoma mansoni* had laid eggs continuously for at least 14 days in a guinea-pig serum. R.T.L.

(64o) Data are presented which demonstrate that *Wuchereria malayi* can be transmitted experimentally from man to the monkeys *Macaca irus* and *M. rhesus*, the slow loris *Nycticebus coucang*, the civet-cat *Viverra tangalunga* and the domestic cat. Human strains of *W. malayi* have been passaged through a monkey, a slow loris and a cat and through a cat into other cats and into a monkey. The microfilariae in all these infected animals were morphologically indistinguishable from those in man and developed normally in *Mansonia longipalpis*, *M. annulatus* and *M. uniformis*. The significance of these animal reservoirs in relation to control of *W. malayi* in man in Malaya is discussed. R.T.L.

(64p) In his introduction to this symposium Adams points out that although severe allergic skin reactions in Europeans may be attributable to onchocerciasis or other filarial infections, ocular complications resulting from *Onchocerca volvulus* infections are extremely rare in Europeans. He is of the opinion that much needless alarm has been caused among the visiting and temporarily resident European population in West Africa. S.W.

64—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

q. WOODRUFF, A. W., BELL, S., RIDLEY, D. S. & SCHOFIELD, F. D., 1958.—" Symposium on onchocerciasis. II. Clinical, diagnostic and therapeutic aspects of onchocerciasis." **52** (2), 97–108.

r. HAWKING, F., 1958.—" Symposium on onchocerciasis. III. Chemotherapy of onchocerciasis." **52** (2), 109–111.

s. CHOYCE, D. P., 1958.—" Symposium on onchocerciasis. IV. Some observations on the ocular complications of onchocerciasis and their relationship to blindness." **52** (2), 112–121.

t. KERSHAW, W. E., 1958.—" Symposium on onchocerciasis. V. Relation between infection with *Onchocerca volvulus* and eye lesions." **52** (2), 122–127.

u. CHESTERMAN, C. C. ET AL., 1958.—" Symposium on onchocerciasis. Discussion." **52** (2), 128–134.

v. BERTRAM, D. S., McGREGOR, I. A. & McFADZEAN, J. A., 1958.—" Mosquitoes of the Colony and Protectorate of the Gambia." **52** (2), 135–151.

(64q) Woodruff *et al.* draw attention to the relatively high incidence of ocular complications in Europeans suffering from onchocerciasis and compare this with the low incidence in Africans living in Calabar and who had prolonged and heavy infections. 21% of 76 proved European cases were symptom-free and these tended to have resided for longer periods in endemic areas. In the Europeans ocular involvement was found even with light infections and early in the course of the disease. Filarial complement fixation tests, skin tests and the appearance of eosinophilia were valuable in the diagnosis of patients only lightly infected or without symptoms. Diethylcarbamazine treatment gave very good results and repeated courses produced radical cure. Although treatment with antrypol alone was not satisfactory its use in conjunction with diethylcarbamazine augmented the effect of the latter. S.W.

(64r) Hawking points out that there have been no striking developments in the treatment of onchocerciasis during the last five years. Diethylcarbamazine and suramin are the only two compounds which have been proved to be of value and schemes of treatment for various groups of persons are outlined. Suramin appears to be the only possible drug for mass treatments. S.W.

(64s) Choyce has examined a number of cases of onchocerciasis in London and in the Cameroons and concludes that, from the ocular standpoint, onchocerciasis is essentially an anterior segment disease and that the lesions are rarely sufficiently serious to cause blindness. One of the major lesions of the posterior segment, which has hitherto been thought to be onchocercal in origin, is now shown to be indistinguishable from the "generalised choroidal sclerosis" described by Sorsby. This is a genetic disease of the eye. S.W.

(64t) Kershaw discusses the relation between infection with *Onchocerca volvulus* and eye lesions; lesions of the anterior segment are related to the intensity of infection of the head and neck but those of the posterior segment are not related to the intensity of infection and may, in fact, not be related to onchocerciasis. The correlation between the distribution and concentration of microfilariae and changes in the anterior segment in several West African communities, and between intensity of infection and lesions of the anterior and posterior segments in one village are shown diagrammatically. S.W.

(64u) Many questions relating to onchocerciasis were mentioned in the discussion including: the longevity and migration of the microfilariae, control methods, mode of production of symptoms, association with dwarfism, urgent need for investigations which will confirm or refute the association of this infection with blindness, work in Liberia, and the use of antrypol and its toxicity. S.W.

(64v) Bertram *et al.* give the results of a mosquito survey carried out in the Gambia, mainly during the rainy season between July and September. Of 54 species and varieties collected 24 are new records for the Gambia. Those of interest as vectors or potential vectors of helminth infections in man and animals are the *Anopheles gambiae* and *A. gambiae* var. *melas* complex, in association with *Wuchereria bancrofti*, *Setaria cervi* and *Dirofilaria aethiops*. The biting habits and behaviour of a number of the anophelines and culicines are discussed. S.W.

64—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

w. McFADZEAN, J. A. & SMITHERS, S. R., 1958.—" Action of piperazine on *Necator*, *Trichuris* and *Strongyloides*." **52** (3), 235–236.
x. NELSON, G. S., 1958.—" 'Hanging groin' and hernia, complications of onchocerciasis." **52** (3), 272–275.
y. WHARTON, R. H., EDESON, J. F. B. & LAING, A. B. G., 1958.—" Laboratory transmission of *Wuchereria malayi* by mosquito bites." [Correspondence.] **52** (3), 288.
z. LAIRD, M., 1958.—" Avian microfilariae, *Wuchereria* vectors and New Caledonia." [Correspondence.] **52** (3), 291–293.

(64w) Piperazine adipate was tested against *Necator americanus* infections in five patients. Three patients were given single doses of 2·4 gm. to 3·0 gm. with overnight starvation and a saline purge before treatment. Some adult worms were passed after a post-treatment purge was given but no significant reduction in egg count was observed. In two patients given two or three doses of 3·0 gm. to 3·6 gm. large numbers of worms were passed and the egg-count was reduced by about 80%. It is concluded that piperazine adipate has some effect against *N. americanus* but that multiple doses are necessary to achieve significant effect. Multiple dose treatment with piperazine adipate was ineffective against infections of *Trichuris trichiura* or *Strongyloides stercoralis*. O.D.S.

(64x) Nelson describes and figures two common but rarely recognized complications of onchocerciasis, namely, hanging groin—a sac of atrophic skin containing sclerosed inguinal or femoral lymph glands—and hernia. The former predisposes to the latter. J.M.W.

(64y) *Wuchereria malayi* has been experimentally transmitted to previously uninfected cats by the bite of laboratory-bred *Mansonia uniformis* which had been fed 10 days earlier on a human or feline carrier. J.M.W.

(64z) Microfilariae of three species were recorded from four out of six species of birds studied in New Caledonia by random examination of a single thin film from each individual. The infected birds were the fantail warbler (*Gerygone flavolateralis flavolateralis*), the rufous-bellied whistler (*Pachycephala rufiventris xanthetraea*), the silver-eared honeyeater (*Lichmera incana incana*) and the grey-backed silvereye (*Zosterops lateralis griseonota*). The over-all microfilaraemia was 51%. All three positive localities were heavily infested with *Aëdes* (*Ochlerotatus*) *vigilax*, an important vector of *Wuchereria bancrofti* in New Caledonia. Laird warns that until criteria for differentiating encysted *Wuchereria bancrofti* from avian microfilariae in the insect host have been established, the possibility of confusion must be recognized in field surveys of *Wuchereria bancrofti* vectors. J.M.W.

65—Veterinariya.

a. PALIMPSESTOV, M. A., GONCHAROV, A. P. & VOITENKO, I. Y., 1958.—[The effectiveness of sulphanilamide preparations in dictyocauliasis of sheep.] **35** (4), 38–41. [In Russian: English summary p. 41.]
b. OZERSKAYA, V. N. & POPOVA, K. A., 1958.—[The comparative value of hypodermic and intratracheal injection of iodine solution in dictyocauliasis of calves.] **35** (4), 41–43. [In Russian.]
c. GRIGORYAN, G. A., AKOPYAN, V. D., KHANBEGYAN, R. A., VEGAPETYAN, V. G. & AIVAZYAN, A. A., 1958.—[Use of tin arsenate against *Avitellina* in sheep.] **35** (4), 43–44. [In Russian: English summary p. 44.]
d. GUPALENKO, A. M., STETSENKO, V. M. & TARAN, G. K., 1958.—[*Hystrichis* infection in ducks in the creeks of the lower streams of the Dniester.] **35** (4), 45–48. [In Russian.]
e. TIKHONOV, G. V., MANAKOV, N. N. & MATVEEV, A. A., 1958.—[Recovery of sheep from fascioliasis and dictyocauliasis.] **35** (4), 49–50. [In Russian.]

(65a) Two preparations of sulphanilamide were tested for the treatment of dictyocauliasis in 151 sheep. Warm 2% to 10% aqueous solutions of "norsulphasol" and a 5% aqueous solution of "sulphantrol" at doses varying from 4 ml. to 5 ml. for lambs aged three to four months to 15 ml. for adult sheep, were intubated intratracheally first into the left lung and two days later into the right lung. The efficacy was ascertained by faecal examination five and ten days later and in some cases by autopsy. The best results were obtained with 3%

and 5% solutions of "norsulphasol" which cured 78·6%–80% and 85% of sheep respectively, without harmful side effects. They were more efficient than 1:1,500 aqueous iodine solution which cured 77%. G.I.P.

(65b) The experimental treatment of dictyocauliasis in eleven calves by the subcutaneous injection of various amounts of iodine solution (in potassium iodide) proved ineffective and cannot replace intratracheal intubation. G.I.P.

(65c) Tin arsenate in doses of 1 gm. per animal was used to treat *Avitellina* in a large number of sheep from affected areas. The treatment was effective and the considerable loss of animals due to this infection ceased. On post-mortem examination four out of five sheep were found infected before the treatment and one out of four after the treatment. G.I.P.

(65d) The loss among ducklings one month after they had been brought to a duck farm in the lower Dniester area was caused by *Hystrichis tricolor* infection acquired on the near-by water reservoir; 40% of the ducks were infected. The authors give short notes on the pathological anatomy, symptoms, diagnosis and control of this infection. G.I.P.

66—Veterinary Medicine.

a. BECKLUND, W. W., 1958.—" Bovine oesophagostomiasis." **53** (2), 103–104.
b. KELLEY, Jr., G. W., OLSEN, L. S., SUMPTION, L. & ADAMS, J. C., 1958.—" Field evaluation of hygromycin B as an ascaricide in swine." **53** (3), 120–126.
c. CAUTHEN, G. E., 1958.—" Low-level phenothiazine administration in a cow and calf program." **53** (3), 131–134.
d. TURNER, J. H. & WILSON, G. I., 1958.—" Strongyloidiasis in lambs." **53** (5), 242–243.
e. HWANG, J. C., McLOUGHLIN, D. K. & WEHR, E. E., 1958.—" Removal of ascarids from pigeons." **53** (5), 263–264.

(66a) Becklund reports that *Oesophagostomum radiatum* was found in 65% of 17 sets of viscera from thrifty native yearling cattle slaughtered in local abattoirs in Georgia and that 90% of 21 sick cattle harboured this species. He describes the post-mortem findings in a three-year-old Guernsey cow which had become anaemic, extremely emaciated and weak and had suffered from severe, persistent diarrhoea; of the 5,175 nematodes recovered 400 were *Oesophagostomum* (young adults and fourth-stage larvae) and the lesions were similar to those described by Andrews & Maldonado in experimental infections [for abstract see Helm. Abs., **11**, No. 40a]. S.W.

(66b) Hygromycin B fed to pigs at the rate of 12 million units per ton of feed for sixty days eliminated *Ascaris lumbricoides* and, under pasture conditions, resulted in an added gain of 13 lb. per pig at the cost of 35 cents. A combination of Hygromycin B and aureomycin in the ration gave still better gains and more efficient feed utilization. When Parvex was added to the Hygromycin B there was no significantly increased gain although it effectively removed Ascaris adults. R.T.L.

(66c) A mixture of 2% phenothiazine with 40% salt and bone meal and 58% cottonseed meal was supplied daily to beef cows and to calves before and after weaning. The mixture was not consumed readily and it was often necessary to add molasses to maintain a daily intake of over 1 gm. of phenothiazine. The results of a series of experiments, which are tabulated, indicate that while some animals gained significantly in weight others failed to do so. The daily effort involved rendered this method of administration impracticable. R.T.L.

(66d) A flock of 165 lambs maintained on a 25-acre pasture in Maryland became emaciated and many passed fluid or soft faeces containing numerous eggs of *Strongyloides papillosus* and insignificant numbers of eggs of other nematodes. Three fatal cases showed severe catarrhal enteritis of the upper part of the small intestine and adult *S. papillosus* numbering 9,000, 23,400 and 26,000 were recovered at autopsy. The lambs had received phenothiazine treatment regularly. The flock was transferred to a new pasture and five weeks later the

lambs were in good health. Their recovery is attributed to the gradual development of an acquired resistance, the effect of the better pasture and the seasonal drop in temperature. R.T.L.

(66e) White King pigeons heavily infected with *Ascaridia columbae* were put for 60 hours on drinking water containing piperazine citrate at the rate of 8 gm. per gallon. Although large numbers of the worms were evacuated the faeces were not completely cleared of eggs. The daily administration for ten days of a single dose of 1 ml. of aqueous solution of piperazine citrate, each containing the equivalent of 50 mg. of the piperazine base, was similar in effect. R.T.L.

67—Veterinary Record.

a. PARFITT, J. W. & MICHEL, J. F., 1958.—" *Nematodirus battus* in cattle." [Correspondence.] **70** (3), 71.
b. GIBSON, T. E., DONE, J. T. & RICHARDSON, M. D., 1958.—" *Toxocara canis* infection in the pig." [Correspondence.] **70** (7), 157.
c. GROVES, T. W., 1958.—" A field experiment to test the safety of cyanacethydrazide for the treatment of cattle." **70** (10), 219–221.
d. SPEDDING, C. R. W., BROWN, T. H. & WILSON, I. A. N., 1958.—" Observations on *Nematodirus* spp. infestation in sheep." **70** (11), 229–232.
e. RAWES, D. A. & SCARNELL, J., 1958.—" Observations on a new anthelmintic (bephenium embonate): its use against *Nematodirus* in lambs." **70** (12), 251–255.
f. LEIPER, J. W. G., 1958.—" The anthelmintic activity of dithiocarbamates against *Ascaridia* and *Nematodirus*." **70** (13), 273–277.
g. BAXTER, J. T., 1958.—" Coenurus in an unusual site." **70** (13), 277.
h. CLEGG, F. G. & BAYLISS, J. B., 1958.—" Coenuriasis as a cause of hydrocephalus in the ox." **70** (21), 441–442.
i. JARRETT, W. F. H., JENNINGS, F. W., MARTIN, B., McINTYRE, W. I. M., MULLIGAN, W., SHARP, N. C. C. & URQUHART, G. M., 1958.—" A field trial of a parasitic bronchitis vaccine." **70** (22), 451–454.

(67a) *Nematodirus battus*, hitherto known only in sheep, has now been found in calves grazing on experimental paddocks and the eggs have been recognized in faecal samples from cattle on commercial farms. R.T.L.

(67b) Following oral administration of infective eggs of *Toxocara canis* to pigs the somatic migration of the larvae caused haemorrhages in the kidneys, lungs and brain. Granulomatous lesions in the kidneys were observed after the experimental introduction of *Ascaris lumbricoides* larvae into the left heart of the pig. R.T.L.

(67c) Cyanacethydrazide, recently introduced by Walley as a vermifuge for *Dictyocaulus viviparus* in cattle, was administered with safety orally to lactating cattle at the rate of 18 mg. per kg. body-weight up to a maximum of 5·4 gm. per head and by subcutaneous injections, as a sterilized solution, at 15 mg. per kg. body-weight up to a maximum of 5 gm. per head. A reduction in milk yield of less than 5% lasted only 12 to 24 hours. R.T.L.

(67d) Observations on the infestation of lambs and associated pastures with *Nematodirus filicollis* are described. It is confirmed that the ewe is not a significant factor as regards lamb infection. The majority of *Nematodirus* eggs are deposited on the pasture by infected lambs during May to July. After a "resting" period the infective larvae migrate up the herbage, numbers reaching a maximum in January and May of the following year. It appears that this danger period may occur at other times in other districts, possibly due to climatic factors. Heavy grazing by resistant stock at this time may give some control. Even if lambs must be grazed on pasture contaminated the previous year, suitable grazing management can provide a fair means of control. D.M.

(67e) A report is given on field trials carried out with a new anthelmintic, bephenium embonate. When administered at the rate of 250 mg. per kg. a dramatic reduction in the

number of larval and adult stages of *Nematodirus* was obtained. The drug is shown to have no toxic effect, and it is suggested that it be administered at three-weekly intervals at the beginning of May and again in mid-June. The beneficial results obtained should be cumulative in the following year. D.M.

(67f) Evidence from preliminary trials shows *n*-butyl *N*-phenyldithiocarbamate (R.D.976) to be an effective anthelmintic against *Ascaridia* in fowls and *Nematodirus* in lambs. As regards the fowl, R.D.976 has no advantages over piperazines but in the case of the lambs, when used in conjunction with phenothiazine, a very good control of both *Nematodirus* and other common lamb nematodes was obtained. R.D.976 does not control the other common nematodes in lambs by itself, and it is recommended that the drug should be administered at the rate of 100 mg. per kg. together with the full therapeutic dose of phenothiazine, dosing to take place at the beginning of May and again a month later. Up to 2·5 times the recommended dose produces no toxic effects. The effect of this drug on the Nematodirus syndrome reported by Kingsbury [for abstract see Helm. Abs., **22**, No. 58b] has not yet been tried, and the field trials were limited to 25 lambs due to the seasonal incidence of *Nematodirus*. D.M.

(67g) The removal of a coenurus from above the hock of a ewe is reported. Its development had been watched over seven months, and at the time of removal the cyst was about the size of a hen's egg. The distribution of the larval heads within the cyst leads to the view that it is *Multiceps multiceps* (*Coenurus cerebralis*) in an unusual site of its usual host. D.M.

(67i) The authors have investigated in a small scale field trial the efficacy of an X-irradiated larval vaccine against *Dictyocaulus viviparus*. The dose of vaccine given was 1,000 irradiated larvae, which protected twelve out of fifteen susceptible calves against the disease when they were feeding on a pasture with a larval count of approximately 1,300 per sq. ft. Ten out of twelve control calves died from the infection. The survivors were killed when their faecal counts had become negative; of the twelve surviving vaccinated animals only two showed any evidence of infection but both surviving controls had become infected. In addition to the decrease in mortality the vaccinated calves had markedly lower faecal counts and respiratory rates than the control animals. The precise dose of the vaccine is still being investigated. It is thought that 1,000 larvae would be adequate in the majority of cases but it is possible that in endemic areas, where calves may be exposed to heavy infections, double vaccination may be desirable. K.H.

68—Wiadomości Parazytologiczne. Warsaw.

a. MICHAJŁOW, W., 1958.—" Jak parazytologia przyczynić się może do postępu myśli ewolucyjnej." [Parasitology in the study of evolution.] **4** (1), 1–17. [English & Russian summaries pp. 16–17.]
b. SPREHN, C. E. W., 1958.—" Równoległe zakażenie jako ważny biotyczny czynnik w układzie pasożyt—żywiciel przy robaczycach." **4** (1), 19–25. [German summary p. 25.]
c. OSHMARIN, P. G., 1958.—" O niektórych właściwościach budowy przywr pasożytujących w steku ptaków (przywry stekowe)." **4** (1), 27–32. [English & Russian summaries p. 32.]
d. STYCZNSKA-JUREWICZ, E., 1958.—" Układ przystosowawczy pasożyt-żywiciel na tle warunków ekologicznych drobnego zbiornika wodnego." **4** (2), 95–104. [English summary p. 104.]
e. KAZUBSKI, S. L., 1958.—" W sprawie występowania motyliczki (*Dicrocoelium dendriticum*) w Polsce." **4** (2), 105–107. [English & Russian summaries p. 107.]
f. TARCZYŃSKI, S., 1958.—" O samodzielności gatunku *Echinococcus multilocularis* Leuckart, 1863." **4** (2), 109–119. [English & Russian summaries p. 119.]

(68b) One of the causes of a break-down in the normal resistance of a host to its parasite is a simultaneous infection with two or more parasites. It has been shown that primary latent helminth infections pave the way for other infections, e.g. bacterial diseases occur often only as a result of a latent helminth infection. A systematic control of latent helminthiases is therefore important. G.I.P.

(68c) The adaptations of flukes parasitic in the cloaca of birds, whence they could be easily evacuated with the excreta, are a short wide body and well developed suckers or sucker-like organs, while the reproductive organs and pores are so adjusted as to allow both suckers to remain attached during copulation. Thus the genital pores open posteriorly in *Leucochloridium* and laterally in *Stomilotrema*, while in *Eumegacetes*, in which they open between the suckers, the cirrus has a large muscular pouch and can be extruded to a considerable distance. G.I.P.

(68d) Quoting her own experiments and data from the literature, the author presents the relationship between *Fasciola hepatica* and its intermediary *Galba truncatula* as influenced by the fluctuating edaphic, thermic and water conditions existing in the habitat of the snails. The effect of the various factors on the development of the fluke larvae and their adaptations to existing conditions are summarized in a table. G.I.P.

(68e) Kazubski enumerates the recorded cases of the occurrence of *Dicrocoelium dendriticum* in Poland. He himself found 50% to 80% of sheep and about 10% of cattle to be infected in the Sanok and Lesko districts. G.I.P.

(68f) Tarczyński reviews literature which deals with the independent existence of *Echinococcus multilocularis* and *E. granulosus*, and reproduces tabular material and illustrations from Vogel (1957). G.I.P.

69—Zeitschrift für Parasitenkunde.

a. SIMHA, S. S., 1958.—" Studies on the trematode parasites of reptiles found in Hyderabad State." **18** (3), 161–218.
b. SIDDIQUI, W. A., 1958.—" On a new trematode, *Astiotrema geomydia* (family Plagiorchidae), from an Indian tortoise." **18** (3), 219–222.
c. ENIGK, K., STICINSKY, E. & ERGÜN, H., 1958.—" Die Zwischenwirte von *Davainea proglottina* (Cestoidea)." **18** (3), 230–236.
d. MATOFF, K. & WASSILEFF, I., 1958.—" Über die Biologie von *Toxascaris leonina* (Linstow 1902), Leiper 1907." **18** (4), 271–291.
e. FAROOQI, H. U., 1958.—" The occurrence of certain specialised glands in the rostellum of *Taenia solium* L." **18** (4), 308–311.
f. SUPPERER, R., 1958.—" Zwei neue Filarien (s.l.), *Eufilaria delicata* spec.nov. und *Ornithofilaria böhmi* spec.nov. aus der Misteldrossel, *Turdus viscivorus* L." **18** (4), 312–319.
g. GOIL, M. M., 1958.—" Fat metabolism in trematode parasites." **18** (4), 320–323.

(69a) In this report of trematodes from Hyderabad, India, Simha includes several new host and geographical records, describes 15 new species, of which two are placed in new genera, and records for the first time *Ganeo tigrinum* and *Pleurogenoides gastroporus* from a reptile (*Chamaeleon zeylanicus*). *Singhiatrema longifurca* n.sp. from *Tropidonotus piscator* is characterized by lobed testes and the extension of the caeca considerably behind the acetabulum. *S. hyderabadensis* n.sp. from *T. piscator* has smooth testes. The diagnosis of *Singhiatrema* is emended and a key is given to the three species of the genus. In *Ommatobrephus megacetabulus* n.sp., also from *T. piscator*, the acetabulum measures roughly more than a quarter of the length of the body and the caeca do not extend behind the acetabulum. *O. nicolli* Gupta, 1954, is considered a synonym of *O. lobatum*. A key gives the features of identification of the three species of *Ommatobrephus*. *Mehraorchis chamaeleonis* n.sp. from *Chamaeleon zeylanicus* differs from other known species of *Mehraorchis* in that the posterior margin of the acetabulum almost touches the equatorial plane of the body. A key is given to the three species of the genus. *Prosthodendrium ovatum* n.sp. from *Calotes nemoricola* can be diagnosed by the position of the acetabulum distinctly anterior to the equatorial plane and of the kidney-shaped ovary which lies to the left of the acetabulum. *P. dollfusi* n.sp. from *C. versicolor* is elongate and thus differs from other known species of *Prosthodendrium*. *Atrophecaecum indicum* n.sp. from *T. piscator* is distinguished from *A. burminis* by the narrow body and the testes which occupy almost the entire width of the fluke. *Haplocaecum asymmetricum* n.g., n.sp. from

Dryophis mycterizans differs from other genera of the Acanthostomidae in that the right caecum is absent. *Paradistomoides intestinalis* n.sp. from *Calotes nemoricola* resembles *P. moghei* but has an elongate body and the gonopore is level with the oesophagus. *P. lanceolatus* n.sp., described from a single specimen from *Chamaeleon zeylanicus*, differs from the known species of the genus in that the body is lanceolate and the ovary lies considerably behind the testes. *P. spatulatus* n.sp. from *Calotes nemoricola* is distinguished by a combination of characters including the size of the body (4·69 mm.–7·24 mm.) and the location of the vitellaria mostly in the anterior half of the body. *Hepatohaemotrema hepaticum* n.g., n.sp. from *Kachuga kachuga* is closely allied to *Enterohaematotrema* but the vitellaria are confined to the posterior portion of the body and the cirrus has three distinct processes. *Xenopharynx pyriformis* n.sp. from *Ptyas mucosus* differs from the known species of *Xenopharynx* in having a pear-shaped body and larger testes situated posteriorly. *X. heterovitellatus* n.sp. from *Tropidonotus piscator* resembles *X. piscator* but the broad caeca fill most of the body and the vitellaria are confined to the anterior half of the fluke. *Neoganada aspinosa* n.sp. from *Chamaeleon zeylanicus* is the only species of *Neoganada* which lacks body spines. Simha lists the trematodes reported in this paper under the hosts in which he found them. M.MCK.

(69b) *Astiotrema geomydia* n.sp. from the tortoise *Geoemyda spinosa*, from United Provinces, India, is characterized chiefly by the flat and elongate body, the position of the ovary about half-way between the acetabulum and the middle of the body and the extension of the vitellaria from the level of the cirrus sac to the anterior end of the posterior testis. Siddiqui gives a key to the ten species of *Astiotrema*. M.MCK.

(69c) Enigk *et al.* attempted to infect several thousand snails and slugs, belonging to 17 species, by feeding them with proglottides of *Davainea proglottina*. They inferred that only the *Deroceras* species (*D. agreste*, *D. reticulatum* and *D. laeve*) are important vectors, basing their conclusion on the incidence of infection, mode of life of the slugs and the degree of parasitism, which was about 1,500 cysticercoids per slug which had been fed three to five proglottides. The species recorded for the first time as susceptible to infection are *D. laeve*, *Lehmannia marginata*, *Arion subfuscus*, *Helicella ericetorum*, *H. candicans* and *Succinea putris*. M.MCK.

(69d) In rabbits which had been given about 3,000 infective eggs of *Toxascaris leonina* the larvae encysted mainly in the caecal wall and also in the diaphragm and skeletal musculature. They had increased many times in size when the rabbits were examined 20 to 33 days after receiving the infective dose. Some of these larvae were then given by the mouth to two other rabbits and were subsequently found alive in nodules in the walls of the caecum and ileum but not in other organs. All of 11 dogs, including one which was already infected, acquired *T. leonina* when fed material containing larvae. But the larvae did not, apparently, re-encyst and the prepatent period was generally ten to fifteen days shorter than in dogs directly infected with eggs. After the administration of infective eggs only 16 of 24 puppies became infected but all of five adult dogs acquired worms. In these dogs which had been infected with eggs the larvae re-entered the gut lumen after 14 to 18 days as compared with a period of nine to ten days reported by Wright. M.MCK.

(69e) At the base of the prebulbar zone of the rostellum in *Taenia solium* there is a glandular structure consisting of nine or ten flask-shaped bodies termed crypts. When seen in transverse section these crypts are arranged in a rosette with the necks directed inwards towards the medullary centre of the prebulbar zone. Each crypt, which seems to be hollow, encloses a layer of pyriform gland cells and is bounded by a fine elastic membrane. M.MCK.

(69f) *Eufilaria delicata* n.sp. from *Turdus viscivorus*, *T. merula* and *Garrulus glandarius*, from Austria, is compared with the three species of *Eufilaria* which have been fully described. It can be distinguished from *E. sergenti* by the body length (20 mm.–24 mm. in the female and 11 mm.–13 mm. in the male) and the location of the vulva behind the oesophageal region,

from *E. asiatica* by the absence of cephalic and caudal papillae and from *E. lari* in which the body is only about half as long but the oesophagus can be as much as four times as wide. *Ornithofilaria böhmi* n.sp. from *Turdus viscivorus* from Austria is distinguished by a combination of characters including the body size (14 mm.–17 mm. × 285 μ in the female and 7 mm.–8 mm. × 210 μ in the male), the width of the intestine which does not exceed that of the oesophagus, the position of the vulva in the oesophageal region and the length of the spicules (102 μ–125 μ and 86 μ–110 μ respectively) and of the microfilariae in the blood (155 μ–166 μ). M.MCK.

(69g) Fat was extracted by pure petroleum ether from batches of three species of trematodes. The total fat content, expressed as a percentage of the dry weight, was *Paramphistomum explanatum* 3·09% to 6·14%, *Fasciola gigantica* 9·38% to 17·22% and *Gastrothylax crumenifer* 0·96% to 1·88%. Whereas the fat content in *P. explanatum* and *F. gigantica* showed a decrease during ten hours of starvation, which was possibly due to the expulsion of fat with the eggs, that in *G. crumenifer* showed a slight increase. M.MCK.

70—Zeitschrift für Tropenmedizin und Parasitologie.

a. RAUSCH, R. & WILLIAMSON, F. S. L., 1958.—" Studies on the helminth fauna of Alaska. XXXIII. The description and occurrence of *Diphyllobothrium alascense* n.sp. (Cestoda)." **9** (1), 64–72. [German summary pp. 71–72.]
b. NAGATY, H. F. & RIFAAT, M. A., 1958.—" Treatment of roundworm (*Ascaris*, *Ancylostoma* and *Trichostrongylus*) infections with piperazine adipate." **9** (1), 73–75. [German summary p. 74.]
c. BUCK, A. A., 1958.—" Ascarisintoxikation (allergischer Schock) bei einem 7jährigen Kinde." **9** (1), 90–91.

(70a) *Diphyllobothrium alascense* n.sp. obtained at autopsy of ten sledge dogs at Chevak, an Eskimo village in Alaska, differs from *D. latum*, which is unknown in Alaska, in the cordate form of the scolex and the larger and more massive strobila. The coils of the gravid uterus do not extend beyond the level of the end of the cirrus sac, the vitellaria are restricted to separate lateral fields and the eggs are 56 μ to 79 μ × 43 μ to 67 μ and have apical knobs. As *Diphyllobothrium* eggs were present in the faeces of 30% of the Eskimoes examined in this region it is probable that this new species is also a parasite of man. R.T.L.

(70b) An initial dose of 4·5 gm. of piperazine adipate followed three days later and two days after that by the same dose failed to reduce the number of ova of *Ancylostoma duodenale* in 98 adults but the faeces of 20 out of 27 individuals were rendered free from *Trichostrongylus* ova by a single dose of the drug. The faeces of 39 out of 45 persons with Ascaris infection became free from ova after the administration of 2·7 gm. daily for three days. R.T.L.

71—Zoologicheski Zhurnal.

a. BARANOVSKAYA, I. A., 1958.—[Contribution to the knowledge of the genus *Paraphelenchus* (Micoletzky, 1922) Micoletzky, 1925 (Nematoda: Aphelenchidae).] **37** (1), 13–19. [In Russian: English summary p. 19.]
b. OVCHINNIKOVA, T. I., 1958.—[On the infection of the mollusc *Bithynia leachi* Schepp. and Cyprinidae with the larval stages of *Opisthorchis felineus* (Rivolta, 1884) in the focus of opisthorchiasis in Sumy-region.] **37** (1), 131–134. [In Russian: English summary p. 134.]
c. SUDAKOVA, I. M., 1958.—[The eelworm fauna of the Chuvash A.S.S.R.] **37** (1), 134–139. [In Russian: English summary p. 139.]
d. PROKOPIČ, J., 1958.—[The helminth fauna of the genus *Sorex* in Czechoslovakia.] **37** (2), 174–182. [In Russian: English summary p. 182.]
e. KIRYANOVA, E. S., 1958.—[On the structure of the copulatory organs of males of the freshwater hairworms (Nematomorpha, Gordioidea).] **37** (3), 359–372. [In Russian: English summary pp. 371–372.]
f. MIKAILOV, T. K., 1958.—[Parasite fauna of *Mugil saliens* Risso of the Caspian Sea.] **37** (3), 373–378. [In Russian: English summary p. 378.]

g. KLESOV, M. D. & POPOVA, Z. G., 1958.—[The biology of *Dicrocoelium dendriticum* (Stiles & Hassall, 1896)—the agent of dicrocoeliasis in ruminants.] **37** (4), 504–510. [In Russian: English summary p. 510.]
h. SICHEVSKAYA, V. I. & PETROVA, T. A., 1958.—[The role of flies in the distribution of helminth eggs in Uzbekistan.] **37** (4), 563–569. [In Russian: English summary p. 569.]
i. PALI, M. A., 1958.—[*Philometra* (*Filaria*) *obturans* Prenant in pike.] **37** (4), 622. [In Russian: English summary p. 622.]

(71a) *Paraphelenchus tritici* n.sp., found in the roots and less frequently the stems of winter wheat, is described and figured from the Moscow region. It lacks mucrones on the tail and is characterized by the spicules which have a sharp ventral process and their head portions are longer than half their length. G.I.P.

(71b) The main source of *Opisthorchis felineus* infection of man and cats in the established focus of opisthorchiasis near the river Vorskla (Sumy district) were ides of which 100% were found to be infected in 1953 and 92·6% in 1954, and which are consumed slightly salted. The infection of roaches, which are eaten cooked, was 23·5% in 1953 and 4·7% in 1954 and that of the molluscs *Bithynia leachi* 2·7% and 1·7% respectively. The infection was spread through contamination of the river banks with human and cat faeces. G.I.P.

(71c) The 45 eelworm species listed from 17 species of crops and weeds in the Chuvash A.S.S.R. include *Aphelenchoides scalacaudatus* n.sp. which is described and figured from the roots of *Raphanus sativus* and the roots and leaves of species of *Allium*. It has a long posterior uterus and is distinguished from other species of *Aphelenchoides* by a conical, ventrally concave tail in both the male and the female, and by the three knobs on the base of the spicules. G.I.P.

(71d) The 42 helminths found in 811 *Sorex araneus*, *S. minutus* and *S. alpinus* in Czechoslovakia are tabulated with their other known hosts and details of their occurrence. Prokopič makes *Vigisolepis barbascolex* a variety of *V. spinulosa* and reports the unusual occurrence of *Schistometra conoides* larvae in *Sorex araneus*. The collection included unidentified *Porrocaecum* larvae from the abdominal cavity and spiruroid larvae, resembling *Trichinella*, from the musculature of *S. araneus*. G.I.P.

(71f) The eight parasite species found in grey mullets in the Caspian Sea included the trematodes *Haploporus longicolum*, *Saccocoelium obesum*, *Haplosplanchnus pachysoma* and larval *Ascocotyle calceostoma* and some unidentified degenerating nematode larvae. The first three species were introduced with the fish from the Black Sea over 20 years ago. G.I.P.

(71g) According to Klesov & Popova, in the forest-steppe region of the Ukraine the natural second intermediate host of *Dicrocoelium dendriticum* is the ant *Formica pratensis* Retz. Metacercariae from naturally infected ants reached maturity by the 45th day in the livers of three out of four rabbits to which they were fed. The maximum worm burden in a single host among ants collected from their nests was 251 metacercariae. The incidence of infection among these ants ranged from 0·09% to 0·45%. Ants of the species *Lasius niger* L. and *Polyergus rufescens* Latr. were not found infected with metacercariae of *D. dendriticum*. J.M.W.

(71h) Taeniid oncospheres (presumably *Taenia saginata*) were present in and on 61 out of 330 flies examined in 1953 in the town of Bukhara. Of the flies collected in the market, mainly from melons, 21·05% were infected and of those collected in a helminthological clinic and a laboratory for the examination of faeces, 12·9%. In three of the 61 flies *Ascaris lumbricoides* eggs were also present. In 1954, 18 out of 365 market flies carried oncospheres. The species of flies infected were *Eristalis aeneus*, *Musca domestica vicina*, *M. sorbens*, *Muscina stabulans*, *Dasyphora asiatica*, *Calliphora erythrocephala*, *Chrysomyia albiceps*, *Pollenia rudis* and *Sarcophaga haemorrhoidalis*. In 1955 and 1956 however, no infections were found probably due to the sanitary improvement of the town, of which large areas had been treated with D.D.T. and BHC. G.I.P.

(71i) Pali quotes literature on the occurrence of *Philometra obturans* in pike in Karelia and the Ukraine. The 20 cm. long worms, being localized in the vessels of the gill arches, obstruct the local blood circulation. G.I.P.

NON-PERIODICAL LITERATURE

72—MEYER, M. C. & PENNER, L. R., 1958.—" Laboratory essentials of animal parasitology." Dubuque, Iowa: Wm. C. Brown Company, x+103 pp.

This laboratory manual has been prepared to meet the needs of students taking their first course in general animal parasitology. It is divided into four main sections, Protozoa, Helminths, Arthropoda and Laboratory Technique. Representatives of each group are described briefly and illustrated by clearly labelled line drawings; simple keys to the main families are given. Much practical information on post-mortem examinations and the collection of parasites, the preparation of specimens for study, preservation and storage, staining and mounting of helminths, examination of faecal samples and blood films etc. is included in the last section and an appendix gives details of the reagents, stains and solutions which are in common use. There is a good index. S.W.

73—PERALTA ZAMORA, L., 1958.—" Contribución al conocimiento de la morfología macro y microscópica del cisticerco celuloso." Thesis, Mexico, 39 pp.

In this academic thesis Peralta Zamora details the morphology, histology and associated host reactions of *Cysticercus cellulosae*, based on a study of material obtained from 37 infected persons (20 biopsies and 17 autopsies) and 100 cysts from the tongues of pigs killed in Mexico City. Forty-nine photomicrographs illustrate the paper. M.McK.

74—UNITED STATES DEPARTMENT OF AGRICULTURE, 1958.—" Index-catalogue of medical and veterinary zoology. Supplement 8. Authors: A to Z." Washington, D.C.: U.S. Government Printing Office, pp. 1–337.

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